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American Veterinary Medical Association

FORMERLY

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(Original Official Organ U. S. Vet. Med. Ass'n.)

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The American Veterinary Medical Association

CONTENTS

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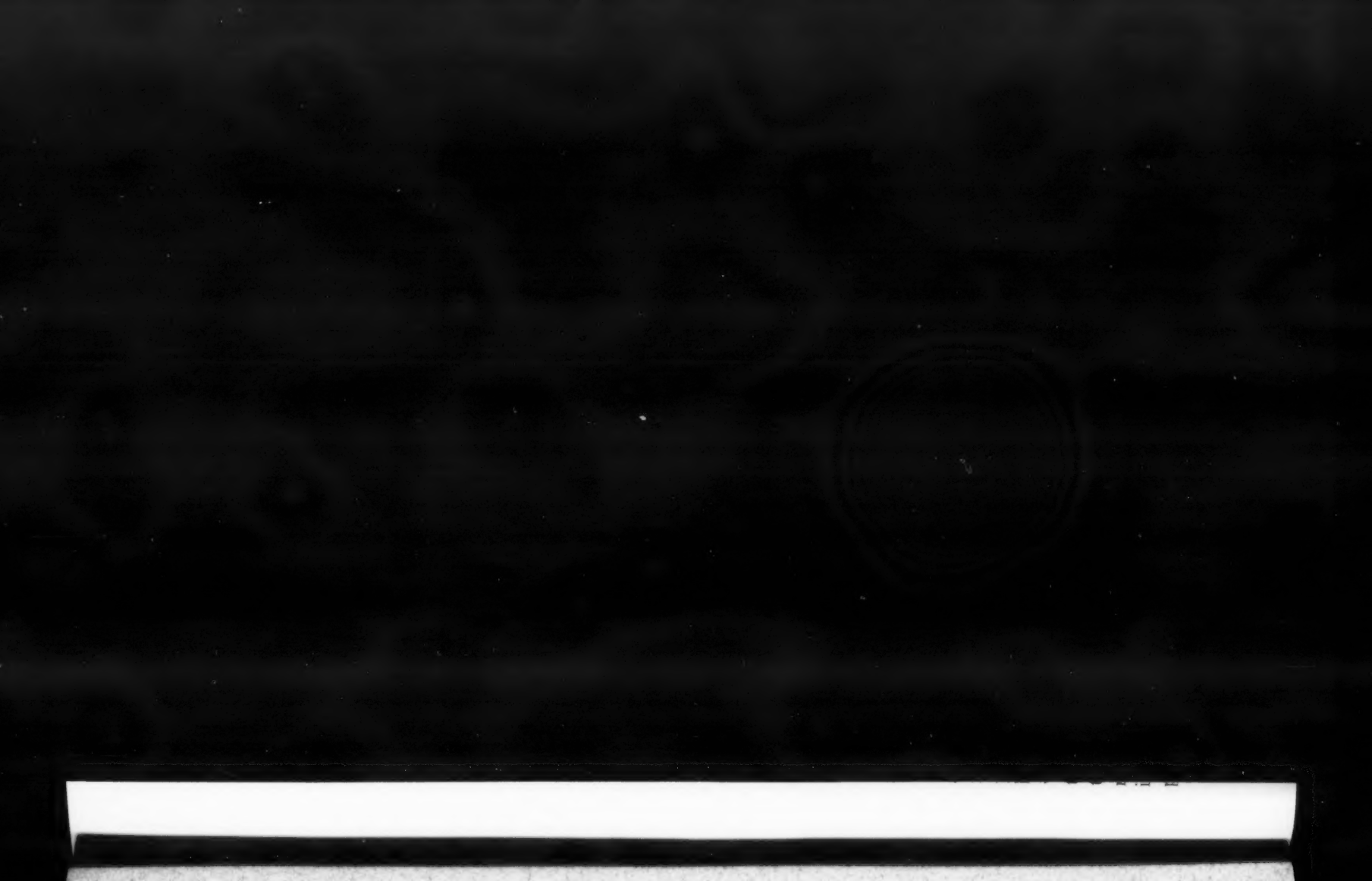

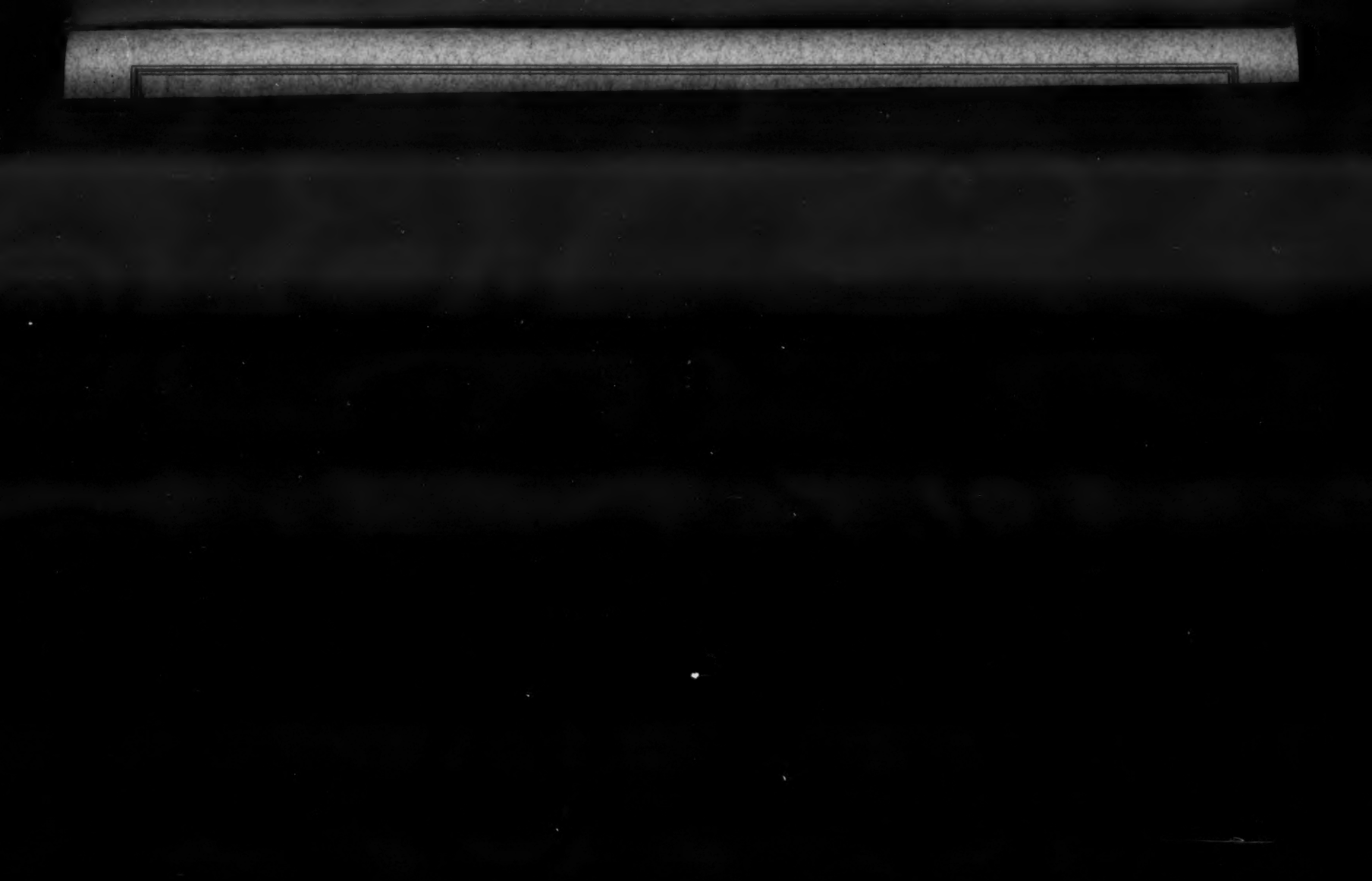

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H. Preston Hoskins, Secretary-Editor, 716 Book Building, Detroit, Mich.

Vol. LXXIII, N. S. Vol. 26 June, 1928 No. 2

TO THE GRADUATES OF 1928

We wish to extend to those young men who are just entering our profession a word of welcome and our good wishes. We know you are better prepared professionally than those who have gone before and we also know that, with the practical training that comes with experience, you will be able to give a wider and better service to the live stock industry than we have done. With your better training and opportunities, however, come increased responsibilities, not only to the profession but to the states and provinces which have contributed so liberally toward your professional training. You must pay this debt in more efficient professional service.

As Dr. Lake says, "It is hard to realize that the affairs of the world and of medicine will not always be in our hands as they are now. Sooner or later we must hand over the reins to younger men." We are not quitting yet, but gradually, and, as the years pass, we will relinquish our grasp to your stronger and better hands. We bid you good cheer and Godspeed. To those of us who can look back over a half-century of veterinary progress, there comes something of a feeling of envy of the splendid opportunities that lie before you. The veterinarian is now properly recognized as a professional man and you will have a standing in the professional and scientific world that few have had in the past. Science has brought new and wonderful discoveries as to

the causative factors in disease and the means to combat them. Invention has given greatly improved appliances for caring for sick and injured animals, as well as a rapid and comfortable means of transportation to your patients.

We congratulate you on entering the veterinary profession at this auspicious time. Those who "have borne the heat and burden" of days gone by have much to learn from you, and they can also contribute much from their practical experience that will be helpful to you if you will take advantage of it. Subscribe for, read, and contribute to veterinary journals. Join veterinary associations and attend veterinary meetings so that when you come to pass the work on to a coming generation, as you will, you can be proud of the professional progress made in your time as we are proud of the progress made in ours.

N. S. M.

Minneapolis, Where Guest is King

PROGRAM COMMITTEE MEETS

Perhaps many of our members do not know that there is a brand new committee in the A. V. M. A., functioning for the first time this year. It is the Program Committee. There has been a very pressing need for such a committee during recent years, brought about largely by the increase in the number of sections in the Association, with the resultant complications and overlappings in the respective sectional programs, including the clinics.

At present the Program Committee consists of the secretaries of the four sections and the Secretary-Editor. A meeting of the Committee was held at Detroit, in the offices of the A. V. M. A., on May 15. All those present seemed to think that the meeting filled a great big need in the task of building up a program for the Minneapolis meeting. To be attractive, well-balanced and successful, a program must be built up along carefully laid plans, rather than to be thrown together from a half-dozen different directions.

The meeting was attended by President Hilty, who has shown a very keen interest in having the Minneapolis program a good one; Dr. W. L. Boyd, of St. Paul, who will be in charge of the clinics at University Farm, on August 10; Dr. B. Scott Fritz, of Harrisburg, Pa., representing Dr. E. P. Althouse, secretary of the Section on General Practice; Dr. M. J. Harkins, of Phila-

delphia, secretary of the Section on Education and Research; Dr. H. J. Milks, of Cornell University, secretary of the Section on Small Animal Practice; and the Secretary-Editor. Dr. R. V. Rafnel, chairman of the Section on Sanitary Science and Food Hygiene, found it impossible to be present, at the last minute, and forwarded his tentative program.

About all that can be definitely stated about the program at this time is that it will include about forty different papers and a number of clinical demonstrations. The subjects that will be presented include the following: infectious bovine abortion, enteritis, fox diseases, hog cholera, sweet clover poisoning, deficiency diseases, anti-tuberculosis vaccination, parasitic diseases, rabies, vulvovaginitis in swine, canine distemper, veterinary education and a number of others of a general character.

The program in full will be published in the August number of the JOURNAL.

Minneapolis, America's Vacation City

EXECUTIVE BOARD ELECTIONS

Within a comparatively few days after this issue of the JOURNAL reaches our members, the polls will close in the elections being held in Executive Board Districts 2 and 3. The voting has been unusually heavy. This was to be expected, of course, by reason of the fact that these two districts include approximately 1600 members, or about 42 per cent of the total membership of the A. V. M. A. Even with the large number of ballots already cast, a hasty calculation reveals that in the neighborhood of 650 members in the two districts have not yet voted.

The Executive Board is the administrative body of the A. V. M. A. Upon the shoulders of the seven members constituting the Board rests a very large part of the responsibility for the successful administration of the affairs of the Association. They serve without pay. Except in isolated cases, where special missions were to be performed, the members of the Board have not even received reimbursement for their actual traveling expenses incurred in attending meetings. This fact is being mentioned at this time because the question has been raised several times recently and in some quarters, at least, the impression has seemed to prevail that the members of the

Board receive compensation for their services in some shape or manner.

If you live in District 2 or 3, and have not voted, return your ballot so that it will reach Detroit by June 7. The polls will close on that date.

Minneapolis, the 1928 Convention City

OUTLINE OF PROGRAM FOR MINNEAPOLIS

	Monday Aug. 6	Tuesday Aug. 7	Wednesday Aug. 8	Thursday Aug. 9	Friday Aug. 10
Morning	Meetings of Committees	Opening Session	Sectional Meetings	Sectional Meetings	Clinic
Afternoon	Meeting of Executive Board	General Session	General Session	General Session	Clinic
Evening	State Association Conference	Alumni Meetings. President's Reception	Banquet	General Session ——— Papers	

Minneapolis, City of Sky Blue Waters

NEW NICOLLET HOTEL
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Minneapolis, the Youngest City of Its Size in the World

APPLICATIONS FOR MEMBERSHIP

See May, 1928, JOURNAL

FIRST LISTING

ABERNETHY, PASCAL MACAULAY 320 Agricultural Bldg., Raleigh, N. C.
D. V. M., Kansas City Veterinary College, 1918
Vouchers: Wm. Moore and W. C. Dendinger.

BONNEVILLE, E. J. 1601 Venice Blvd., Los Angeles, Calif.
D. V. M., United States College of Veterinary Surgeons, 1923
Vouchers: W. L. Curtis and J. P. Bushong.

BULLOCK, R. E. Lebanon, Ohio
D. V. M., Cincinnati Veterinary College, 1915
Vouchers: L. A. Mosher and D. M. Swinehart.

BURGESS, DELBERT ROY Grand Rapids, Minn.
D. V. M., McKillip Veterinary College, 1918
Vouchers: Chas. E. Cotton and R. Fenstermacher.

CANION, CLAUDE 809 Congress Ave., Houston, Texas
D. V. M., A. & M. College of Texas, 1925
Vouchers: R. P. Marsteller and A. A. Lenert.

CHENEY, JOHN BAIRD P. O. Box 61, Potsdam, N. Y.
D. V. M., Cornell University, 1924
Vouchers: David F. Deming and C. R. Guile.

CHENOWETH, JOHN W. Albany, Mo.
D. V. S., Western Veterinary College, 1901
Vouchers: J. D. Ray and J. S. Barbee.

DOWLING, EDMUND M. 1325 Columbus Ave., Springfield, Mass.
D. V. M., United States College of Veterinary Surgeons, 1918
Vouchers: H. W. Jakeman and T. A. Doyle.

DUDGEON, E. L. Platte City, Mo.
D. V. S., Western Veterinary College, 1907
Vouchers: J. D. Ray and J. S. Barbee.

DUNCAN, W. T. 320 S. Benton Ave., Springfield, Mo.
D. V. S., Western Veterinary College, 1901
Vouchers: Ralph Graham and H. A. Wilson.

GENTRY, LESTER PERRY Ottawa, Kans.
D. V. S., University Veterinary College, 1905
Vouchers: Chas. W. Bower and R. R. Dykstra.

JAEGER, JOHN A. West Concord, Minn.
D. V. M., McKillip Veterinary College, 1916
Vouchers: Chas. E. Cotton and R. Fenstermacher.

JAYNES, CORNELIA 253 Nassau St., Princeton, N. J.
D. V. M., Cornell University, 1927
Vouchers: Frederic S. Jones and Ralph B. Little.

JOHNSON, BURNETT CARPENTER
634 Live Stock Exchange Bldg., South St. Paul, Minn.
D. V. M., United States College of Veterinary Surgeons, 1920
Vouchers: G. E. Totten and C. L. Hall.

JOHNSON, LEO RUDOLPH 920 East 19th St., Minneapolis, Minn.
D. V. M., McKillip Veterinary College, 1918
Vouchers: Chas. E. Cotton and W. C. Bromaghin.

KAGEY, J. F. Kingsport, Tenn.
D. V. M., United States College of Veterinary Surgeons, 1918
Vouchers: M. Jacob and G. A. Metcalf.

LARSON, JOHN J. Battle Lake, Minn.
D. V. M., Chicago Veterinary College, 1918
Vouchers: E. A. Hewitt and R. Fenstermacher.

McDaniel, John Samuel — 711 West Main, Sedalla, Mo.
D. V. M., Kansas City Veterinary College, 1909
Vouchers: Fred C. Cater and A. Goodlive.

Meyer, Earl H. — Albion, Nebr.
D. V. M., St. Joseph Veterinary College, 1923
Vouchers: S. M. Score and Floyd Perrin.

Pieper, Fred Clarence — West Concord, Minn.
D. V. M., Ohio State University, 1923
Vouchers: Chas. E. Cotton and R. Fenstermacher.

Raterman, Nicholas F. — Fort Laramie, Ohio
D. V. M., Cincinnati Veterinary College, 1912
Vouchers: D. M. Swinehart and O. V. Brumley.

Ruggles, William Elmer — 13th and Couch Sts., Portland, Ore.
D. V. M., Colorado Agricultural College, 1927
Vouchers: Horst Schreck and Fred C. Schmidt.

Ryan, Andrew D. — Stewart, Minn.
D. V. S., St. Joseph Veterinary College, 1910
Vouchers: W. L. Boyd and R. Fenstermacher.

Schlotthauer, Carl Frank — Mayo Foundation, Rochester, Minn.
D. V. M., St. Joseph Veterinary College, 1923
Vouchers: C. P. Fitch and R. Fenstermacher.

Sears, Kirtley — 508 North Buchanan St., Maryville, Mo.
D. V. M., St. Joseph Veterinary College, 1923
Vouchers: A. T. Kinsley and J. D. Ray.

Simonds, Edward B. — Riverdale, Md.
D. V. M., United States College of Veterinary Surgeons, 1918
Vouchers: A. E. Wight and E. M. Pickens.

Smotherman, Ervin Cloud — Hillsboro, Texas
D. V. M., Southwestern Veterinary College, 1914
Vouchers: J. S. Watson and Leon G. Cloud.

Stuchell, H. Arthur — Luckey, Ohio
D. V. M., Grand Rapids Veterinary College, 1910
Vouchers: D. M. Swinehart and O. V. Brumley.

Sullivan, Leo P. — 1602 Pacific St., St. Joseph, Mo.
D. V. M., St. Joseph Veterinary College, 1920
Vouchers: G. E. Tottem and Irvin Owens.

Tierney, Thomas L. — Walnut, Iowa
D. V. M., St. Joseph Veterinary College, 1920
Vouchers: J. F. McCabe and Grant B. Munger.

Townsend, Geo. F. — 116 S. Kentucky St., Sedalia, Mo.
D. V. M., Kansas City Veterinary College, 1913
Vouchers: A. T. Kinsey and J. D. Ray.

Warth, Arthur Lee — Garnett, Kans.
D. V. S., Western Veterinary College, 1908
Vouchers: A. Kushner and Chas. W. Bower.

Whitcomb, Walter H. — Plainview, Minn.
D. V. S., Western Veterinary College, 1903
Vouchers: W. L. Boyd and R. Fenstermacher.

Woods, Millard M. — Box 544, Mason City, Iowa
D. V. M., United States College of Veterinary Surgeons, 1918
Vouchers: C. L. Elliott and S. L. Ries.

Applications Pending

Second Listing

Betzold, William F., 819 M St., Sanger, Calif.
Blake, Walter G., P. O. Box 615, Greeley, Colo.
Butler, Homer Clayton, Lock Box 456, Madelia, Minn.
Cheney, David W., 201 Patterson St., Ogdensburg, N. Y.

Conover, Robert, 624 Huron St., Toledo, Ohio.
Fitzwater, Mahlon Claude, Bloomingdale, Mich.
Ford, Ira M., Edgerton, Minn.
Gauntt, I. G., Jasper, Ala.
Golden, John Wesley, Redwood Falls, Minn.
Gordon, Reuben, 400 W. Main St., Patchogue, L. I., N. Y.
Grady, Daniel Theodore, Windom, Minn.
Greaves, Harold A., Glenwood, Minn.
Green, Merle Cedric, Spring Grove, Minn.
Hanson, R. E., Forest City, Iowa.
Hattery, Morton, 4220 Berkely Ave., Chicago, Ill.
Johnson, Clarence Henry, 1061 S. Smith Ave., St. Paul, Minn.
Lamoreaux, Morris Florance, Comstock Park, Mich.
Larson, George A., Jr., Breckenridge, Minn.
Meyers, Sidney Ralph, Mountain Lake, Minn.
Noonan, Albert J., 5733 S. Peoria St., Chicago, Ill.
Ostendorf, Alford T., Red Lake Falls, Minn.
Runyan, Bruce, 124 E. McCreight Ave., Springfield, Ohio.
Thompson, John Eino, 245 W. Harvey St., Ely, Minn.
Vancura, Thos. W., New Prague, Minn.
Vollmar, Otto George, Montgomery, Minn.
Wolf, Arvine J., Bolivar, Ohio.

REINSTATEMENT

Moyer, Vincent C., 2400 Linden Drive, Merwood Park, Upper Darby, Pa.

The amount that shall accompany an application filed this month is $7.91, which covers membership fee and dues to January 1, 1929, including subscription to the JOURNAL.

Minneapolis, Where Guest is King

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 5th Ave. & 103rd St., New York, N. Y., June 6, 1928. Dr. C. P. Zepp, Secretary, 128 W. 53rd St., New York, N. Y.

Mahoning Valley Veterinary Club. Indiana, Pa., June 8, 1928. Dr. R. M. Quigley, Secretary, P. O. Bldg., Tyrone, Pa.

Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. June 11, 1928. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.

Oklahoma State Veterinary Medical Association. Stillwater, Okla., June 11-12, 1928. Dr. Frank R. Knotts, Secretary, Stillwater, Okla.

California State Veterinary Medical Association. San Diego, Calif. June 11-12-13, 1928. Dr. W. L. Curtis, Secretary, 1264 W. Second St., Los Angeles, Calif.

Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. June 18, 1928. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.

Texas A. & M. College Short Course for Veterinarians and State Veterinary Medical Association of Texas. College Station, Texas. June 18-19-20-21-22, 1928. Dr. D. Pearce, Secretary, Leonard, Texas.

Eastern States Tuberculosis Eradication Conference. The Weirs, N. H. June 19-20, 1928. Dr. E. A. Crossman, Chairman, Program Committee, 2001 Customhouse Bldg., Boston, Mass.

Michigan State Veterinary Medical Association. Union Bldg., Michigan State College, East Lansing, Mich. June 26-27, 1928. Dr. E. K. Sales, Secretary, 535 Forest St., East Lansing, Mich.

Missouri Veterinary Medical Association. Carthage, Mo. June 26-27-28, 1928. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.

North Carolina State Veterinary Medical Association. Greensboro, N. C. June 27-28, 1928. Dr. W. T. Scarborough, Secretary, 320 S. Blount St., Raleigh, N. C.

Illinois State Veterinary Medical Association. East St. Louis, Ill. July 5-6, 1928. Dr. W. H. Welch, Secretary, Lexington, Ill.

British Columbia, Washington and Oregon Veterinary Medical Associations. Portland, Ore. July 9-10-11, 1928. Dr. J. W. Kalkus, Secretary, Puyallup, Wash.

Vermont Veterinary Medical Association. Burlington, Vt. July 10-11, 1928. Dr. G. N. Welch, Secretary, Northfield, Vt.

New York State Veterinary Medical Society. Coney Island, N. Y. July 11-12, 1918. Dr. C. E. Hayden, Secretary, 110 Irving Place, Ithaca, N. Y.

Kentucky Veterinary Medical Association. Henderson, Ky. July 11-12, 1928. Dr. C. G. Kreidler, Secretary, Maysville, Ky.

New Jersey, Veterinary Medical Association of. Asbury Park, N. J., July 12-13, 1928. Dr. E. R. Cushing, Secretary, New Brunswick, N. J.

Maryland State Veterinary Medical Association. College Park, Md. July 19-20, 1928. Dr. E. M. Pickens, Secretary, College Park, Md.

Virginia State Veterinary Medical Association. Blackburg, Va. July 31, 1928. Dr. P. J. Landis, Secretary, Winchester, Va.

American Veterinary Medical Association. New Nicollet Hotel, Minneapolis, Minn. August 7-8-9-10, 1928. Dr. H. Preston Hoskins, Secretary, 716 Book Bldg., Detroit, Mich.

WHAT IS DAIRY FARM INSPECTION?*

By Louis A. Klein, *Philadelphia, Pa.*

Dean, School of Veterinary Medicine, University of Pennsylvania

Within recent years, many of the terms used in connection with milk control work have come to have a definite meaning and consequently, when they are used, they convey a concrete idea. This is true of such terms as bacterial count, pasteurization, certified milk, etc., but it is not true of the term dairy farm inspection. This term is applied to examinations or inspections differing greatly in character and scope. Hence the query: What is dairy farm inspection? The purpose of this paper is to present the writer's opinion as to how this question should be answered, and how the present unsatisfactory condition may be remedied.

The inspection of a dairy farm should include all of the factors concerned in the production and handling of the milk. It should also take into consideration the influence of the environment in which the various operations are carried on. It should be based (1) on the information existing in regard to the physiology of the dairy cow and the pathology and bacteriology of the various diseases of that animal, especially as related to the milk secretion and to the maintenance of a sanitary environment; (2) on the established facts regarding the sources of the non-pathogenic organisms commonly present in milk and their effect on the milk; and (3) on our knowledge of how milk may be infected with the organisms of such specific infections of man as typhoid fever, septic sore throat, diphtheria and scarlet fever. These facts are fundamental. They should therefore receive careful consideration in formulating a system of dairy farm inspection, and should be our guide in making inspections and in reaching decisions.

In many instances, the term, dairy farm inspection, is used to describe an examination of the cows, stables, milk-house and utensils for cleanliness. While such an examination is important and of great value, it is not all there is to dairy farm inspection. Sometimes an examination of this character is called a sanitary inspection but this is a misnomer. A sanitary inspection of a dairy stable should include an examination to determine whether

*Presented at the sixty-fourth annual meeting of the American Veterinary Medical Association, Philadelphia, Pa., September 13-16, 1927.

or not the conditions existing in the stable or its surroundings favor the harboring or spread of infectious material or affect unfavorably the various physiological functions of the cow. It should not be limited to an examination to detect conditions which may permit dirt to enter the milk. In many cases, the inspection for cleanliness is made by an inspector who has no knowledge of the fundamentals involved. A set of printed rules may serve as a guide to such an inspector and they may enable him to deal more or less successfully with conditions anticipated by the person who drew up the rules but when other conditions are met with he is not able to deal with them on a rational basis, and then the interests of either the consumer or the producer are likely to suffer.

In dairy farm inspection of this type, the condition of the cow with regard to disease receives no attention. Certain physiological states which are accompanied by undesirable changes in the secretion of the mammary gland are also neglected. The practice of methods necessary to maintain cleanliness may prevent some of the pathogenic organisms discharged by a diseased cow from getting into the milk after it is drawn but they can have no effect in keeping out the organisms discharged from the udder; nor can they overcome changes in the composition of the milk due to pathological or physiological conditions.

Trained Inspectors Needed

In some cases, a list of diseases is included in the milk ordinance, or regulations, with the statement that no milk shall be used from cows affected with any of the diseases named. Apparently, this action is based on the assumption that every dairyman is an expert in diagnosing diseases of the dairy cow but it is more probable that the provision was copied from some earlier ordinance or regulation without any special thought being given to the matter. But even if all of the men in charge of dairy herds were expert diagnosticians, the question as to whether the milk of a dairy cow is suitable for human food cannot always be decided in such a simple manner. The same disease might be localized in one cow and have no effect on the milk, while in another the lesions may be so located or in such a stage that the milk contains pathological products, or is infected with pathogenic bacteria when it comes from the udder or exposed to such infection during its withdrawal. To handle properly this part of dairy farm inspection, it is necessary that a physical examination of each

cow be made for symptoms of disease and when disease is found the decision as to whether the cow is suitable for milk production should be based on the established facts regarding the etiology and pathology of the condition present. Is the causal organism pathogenic for man? What effect has it on milk? Is it being excreted in the milk, or is it likely to be so excreted? Is it being excreted through any other channel and thus likely to infect the milk after it is drawn from the udder? Is fever present? Is the composition of the milk changed? Is the disease contagious from cow to cow? These are some of the points which must be considered in such cases if the question is to be decided on a rational basis.

Many municipalities have been depending on pasteurization alone to protect the milk consumer against those conditions of the dairy cow which may render milk harmful or unpalatable. The same process has also been relied on as a safeguard against the human infections which are sometimes transmitted by milk. Within the last year or two, however, the opinion has been gaining ground that this arrangement does not give adequate protection. While pasteurization is generally regarded as an effective safeguard against milk-borne epidemics of typhoid fever and other acute human infections, its power as ordinarily carried out to afford equal protection against infected milk with tubercle bacilli is questioned. In comparatively recent scientific tests[1,2] of the efficiency of commercial pasteurizing apparatus, the results obtained were very disappointing, especially the failure to destroy tubercle bacilli. These uncertainties and the extension of tuberculin-testing under the accredited-herd and area plans, particularly the latter, has caused the tuberculin test to be required in many cases as an additional safeguard.

Many Cities Require Tuberculin Test

At the present time, according to statistics compiled by the United States Bureau of Animal Industry, 874 municipalities, including such cities as Chicago, Baltimore, Cleveland, Detroit and Louisville, require all cows producing milk sold within their jurisdiction to pass the tuberculin test whether the milk is to be pasteurized or sold in the natural state. In addition, 375 towns and cities permit of a choice between tuberculin-testing and pasteurization, making a total of 1,249 communities which have adopted the tuberculin test as a protection against bovine tuberculosis. Furthermore, in a number of cities where the

tuberculin test is not required by law, the milk distributors are offering a special grade of milk from tuberculin-tested cows, which is an indication that there is a demand for this form of protection in communities where it is not as yet a legal requirement. This trend in milk control will not be surprising to those who remember that when pasteurization was adopted as a protection against tuberculous infection, fifteen or sixteen years ago, it was generally regarded as a makeshift and was accepted because of the difficulties connected with tuberculin-testing at that time. These difficulties having been largely overcome, it is only natural that the tuberculin test should now be required as a protection to the milk consumer against bovine tuberculosis.

Another objection to complete dependence on pasteurization is that under such an arrangement there is only a single barrier against the invasion of the milk supply by disease-producing germs, and since the operation of the pasteurizing machinery is subject to the frailties of human nature, this barrier is liable to be let down at times, leaving the way open for infection to reach the milk consumer. It is therefore considered necessary that there should be a second barrier established in the form of a system of inspection covering the cows and the dairy farms as well as the pasteurizing and distributing plants. It is conceivable, of course, that this barrier also might break down at times but with a double check there would always be some measure of protection, as it is not at all likely that both barriers would give way at the same time.[3]

Sole Reliance on Pasteurization in Some Places

There are some municipalities which depend on pasteurization altogether and do not make an inspection of dairy farms for cleanliness. I could mention the name of one large city where this plan is in operation in which the milk distributors found it necessary to employ dairy farm inspectors at their own expense in order to eliminate from their supply milk which in warm weather would sour before it could be pasteurized or which would curdle during the heating. In another large city operating under this plan, it was observed that in warm weather there was a great increase in the number of cases of infantile diarrhea although the bacterial content of the pasteurized milk was quite low. It was found, however, that at such times the bacterial count of the milk before pasteurization was very high. For two years in succession, the increase in mortality was coincident with an

increase in the number of bacteria in the milk before pasteurization, although the bacterial content of the milk after pasteurization was quite low. In the following year, the total pre-pasteurization bacterial content was greatly reduced by more stringent regulation but when the hot weather set in the mortality from infantile diarrhea again increased and it was then observed that the additional regulatory measures had failed to decrease *B. coli*, the peptonizers, and the alkali-formers proportionately with the other bacteria and that the increase in mortality ran parallel with the highest incidence of these species in the milk before pasteurization. Earlier investigations have demonstrated that colon and peptonizing bacteria bring about changes in milk which cause diarrhea but the results of other studies indicate that hot weather and improper care are important etiological factors.[4]

Officials of some of the larger cities without dairy farm inspection sometimes, in explaining the omission, give as a reason that the milk supply is drawn from such great distances and from so many farms that it is not possible to inspect all of the farms, although at the same time there are other large cities that draw their milk from fully as great distances and from equally as many farms that manage to inspect all of the farms.

Standard System of Inspection Needed

In view of the indications of a more general appreciation of the value and importance of dairy farm inspection it would seem to be desirable that the procedure should be definitely defined and standardized. The definitions for different grades of milk recommended by the Commission on Milk Standards of the New York Milk Committee several years ago have had the effect of giving a more definite meaning to the term "pasteurized milk," while the work of the Laboratory Section of the American Public Health Association has resulted in the standardization of the methods commonly used in the laboratory examination of milk. The situation would be further improved if a standard system of dairy farm inspection could be formulated. This would have the effect not only of giving a definite meaning to the term but it would also lead to the work being done in a uniform manner. If the suggested standard is based on the fundamentals involved, any one with a knowledge of these fundamentals will be able to apply it uniformly to conditions in which the essentials are the same even though the details may vary. And, since dairy farm inspection is a form of veterinary practice it would seem that the

American Veterinary Medical Association is the organization which should formulate and sponsor such a standard. A committee should be appointed to draw up an outline or description of a proper system of dairy farm inspection and when this has been approved by the Association it could be used as a standard in carrying on this work. The committee should be continued from year to year in order to recommend such changes or additions as newly discovered facts may make advisable.

A standard of this character would no doubt have considerable influence in improving dairy farm inspection. It would probably also cause it to be better understood and consequently more often appraised at its true value.

REFERENCES

[1]Commercial Pasteurization. Pub. Health Bul. 147, Feb. 1925.
[2]Putnam, George W.: Chicago's program for correction of pasteurization defects. Amer. Jour. Pub. Health, xvii (1927), 2, pp. 121-130.
[3]Frank, Leslie C.: A national program for the unification of milk control. Pub. Health Rpts., xli (1926), 31, pp. 1583-1616.
[4]Schrader, J. H., & Swenarton, J. C.: Effect on infants of high pre-pasteurization counts. Amer. Jour. Pub. Health, xv (1925), 5, pp. 427-433.

DISCUSSION

DR. L. N. REEFER: I would like to ask Dr. Klein if he thinks the score card used by the Bureau at present is the best thing we have in the line of standardization of the work. We have been using that since 1913. Wheeling was one of the first cities of the country, the very first city of its size (50,000 inhabitants), to require the tuberculin-testing of all animals furnishing milk to the city. We have 478 dairies shipping milk into the city of Wheeling at present, from Ohio, Pennsylvania, and counties in our own state adjacent to Wheeling. We not only require the tuberculin-testing of the animals, but each farm is scored and a record kept. The largest distributing concern, the United Dairy Company, also employs a farm inspector and I approve very heartily Dr. Klein's suggestion that the Association should adopt some method, and I think the score card as used at present can be improved on in a number of respects.

DR. KLEIN: Well, to be frank and to put the matter very plainly, of the score cards which are commonly in use, I think the Bureau score card is the poorest one of the lot. I say this because it does not cover the inspection of the cow very thoroughly; it simply allows six points for the health of the cow—6 out of 40. Now the cow is one of the most important factors in milk production, and it does not make any difference how much trouble is taken to have the cow clean and the barn clean and the hands of the milker clean, and the utensils clean, if the cow is not healthy, if she is eliminating bacteria from the udder, or is infected with a disease which changes the composition or flavor of the milk, none of these other things will produce good milk.

Now, since score cards have been mentioned, I will say that, in my opinion —of course, I do not pretend to give the final word on this subject—I think the score card used by the District of Columbia is the best score card in use in this country. But in speaking of standards for dairy inspection, I did not have the score card in mind. I look upon a score card simply as a method of recording the inspector's judgment of the conditions he has found. It is just a record. Of course, it serves as a guide to an untrained inspector, and probably the Bureau score card was designed for that purpose. But what I had in mind was an outline of a system of dairy farm inspection. At the present time, when we are told a dairy farm has been inspected, we do not know exactly what that means. Sometimes it means that someone has just gone to the farm and peeked into the barn and casually looked over the cows and

said, "The cows appear to be in good condition, the stable seems to be clean." He goes to the milk-house and looks around and things seem pretty good there, and then goes away.

On the other hand, when a man goes to a dairy farm and goes over each cow in detail, making a physical examination; measures the stable to determine the cubic air content; examines the ventilation system, determining the size of the ventilator inlets and outlets to see if they are of sufficient size; goes to the milk-house and looks into the equipment; considers the construction of the stable and milk-house from a sanitary standpoint; looks at the drainage of the whole plant; looks after the water supply, where it comes from, whether it is likely to be contaminated—that is also called dairy farm inspection. Now, the same name does not belong to the two operations, and we ought to have a definition of the term, so that when we use it other people will know what we mean, and it seems to me that the members of this Association ought to be looked upon as authorities on this subject and that if they formulate a definition of dairy farm inspection, based on the principles involved, it will receive recognition. I did not have in mind that this outline should go into all the details in regard to this work, and be a sort of textbook on dairy farm inspection. I would assume that the man who is going to do dairy farm inspection and carry out this system would be properly educated for the work.

Dr. W. G. Hollingworth: A year ago, in this hotel, the International Association of Dairy and Milk Inspectors had their annual meeting. I read a paper on dairy inspection, and at the close of the meeting there was a resolution adopted in regard to efficiency in the selection of dairy inspectors. A copy of that resolution was sent to every health officer throughout North America.

Just as Dr. Klein says, there are a number who will go in and inspect a dairy by just looking in and walking away, and that will be the end of it. It is time to eliminate politics from public health work. If there is any subject or any phase of the veterinary profession today that needs close attention, it is along the lines of dairy inspection, which naturally comes under food hygiene. In my city, some few years ago, there was a Bureau of Food Hygiene established, with the idea of eliminating prosecution and promoting education.

Now I find that the dairymen in my district are very anxious to cooperate in improving conditions. Then the milk dealers were brought in and soon we had a sort of friendly gathering every so often. Once a year, all the dairymen furnishing milk to the milk dealers—there are about seventy in Utica—get together; they have a sort of a reunion—the same as we had last night—and they discuss their problems. We must understand that the dairymen have a world of problems. We need them very badly; we can not exist without them. So the result is they must get cost plus a profit for their products, or else they can not exist; that is a business proposition. Now they get together and talk about the milk situation, the cleanliness of the milk, the premium on products delivered, and all such conditions as that. That is the idea of this association, and it is working wonderfully.

I do not believe in compulsion at all, but in education. Just to show you what it will do, two years ago, I brought out the idea that we would like to have the milk dealers get more interested in pasteurization, and in checking up I found that we had seven. The first of January of this year, we had forty-two, and they have just come of their own free will. There was nothing at all compulsory about it. Now the rest of them are forming. One gentleman has come and offered to put up a plant and pasteurize the milk for all the others who wish the milk pasteurized, so practically we have 90 per cent or better of pasteurized milk, without any compulsion at all. It is nothing less than education.

Dr. B. T. Woodward: Dr. Klein spoke of the Bureau score card as probably being the least desirable. There are six points allowed for the health of cattle. The veterinarian was not consulted at all in the original preparation of that card, over twenty years ago.

Member: I would like to have Dr. Klein say something about the abortion bacillus.

DR. KLEIN: We have a lot of very valuable information about the abortion bacillus, about its biological characteristics, serology, and no doubt it is very similar to the bacillus of Malta fever. We find a parallelism even in the pathology. The bacillus of Malta fever will produce practically the same lesions in the goat as the bacillus of abortion produces in the cow. In the goat, the bacillus of Malta fever is eliminated in the milk, in a large number of cases, just as the bacillus of abortion is eliminated in the milk of the cow. Abortion has been produced experimentally in the cow with the Malta fever bacillus, and abortion has been produced in the goat with the abortion bacillus. A close parallel. But there the parallel stops. When we look at what might be called the epidemiological side of the matter, we do not find this parallelism. Wherever goats' milk or the products of goats' milk are used to any great extent as human food, Malta fever is endemic. But where cows' milk is commonly used as human food, the abortion bacillus has not been found in man in a great number of cases, considering the large number of people who consume milk known to be infected with the abortion bacillus. The abortion bacillus has been found in the blood of patients showing symptoms similar to those of Malta fever, and the same organism has been isolated from the blood in atypical cases, but the number of such cases is extremely small considering that cows' milk infected with the abortion bacillus is used extensively all over this country.

There is one observation on record that I think is worth a great deal in considering this question. At the University of California they had a dairy herd they had been using to produce certified milk for several years, a very good herd, cows in very good condition, but they had abortion and they started to study this disease. They made a number of examinations and there was not a week passed by that there were not samples taken and examined for the presence of abortion bacilli, and they have positive information as a result of these tests that there never was a week that there were not cows in that herd eliminating abortion bacilli in the milk. The milk was sold to families in the community surrounding the University for a period of over two years. About three hundred quarts were delivered daily and no case resembling Malta fever occurred among those consuming the milk, although it was ingested daily for over two years.

DR. B. K. MCINNES: Several very interesting facts have been brought to my attention in the last six months in regard to the interest that has been taken by the medical profession. We have had a hard fight, as you all know, in getting away from the question of only pasteurizing as a safeguard and not going out and having proper dairy inspectors to inspect the dairy farms. In the *Journal* of the American Medical Association, a few months ago, there was an article on who shall do this work. A sketch was taken from the British Conference, which was held just about three weeks before, on the veterinarian having the opportunity of really doing the dairy inspection work. I thought that after the American Medical Association started a discussion of this kind, the suggestion Dr. Klein made just now about getting together and doing something was very opportune.

Now, as you all know, they have always said that pasteurizing was all they did. Now, Charleston has all pasteurized milk and, unfortunately, until the first of the year, did very little inspection work. The first of this year, we started a complete survey of all the farms shipping into Charleston, and I believe we have changed them a great deal. I supervised some of that work, and found that what helped me most was not only inspecting these dairies, but I take a picture of the dairy when we start and after we finish, and I bring those into the City to get an appropriation from the City Council. That has been one of my greatest helps. Before, the appropriation was always small; we could not get money enough to do the work, and now, with some real evidence, there is no trouble getting money enough to do it. I believe, if a lot of cities and veterinarians want to put this over, and use the same method, they would find the appropriations very easy to get; and without the money you can not do anything.

REVIEW OF THE WORK OF THE AMERICAN FOOT-AND-MOUTH DISEASE COMMISSION*

By HARRY W. SCHOENING

U. S. Bureau of Animal Industry, Washington, D. C.

In March, 1925, the U. S. Department of Agriculture appointed a commission for the study of foot-and-mouth disease in Europe. The commission consisted of Dr. Peter K. Olitsky, Rockefeller Institute for Medical Research, New York; Dr. Jacob Traum, Division of Veterinary Science, University of California, Berkeley, Calif.; and Dr. Harry W. Schoening, U. S. Bureau of Animal Industry, Washington, D. C. The Commission left the United States in May, 1925, and returned in June, 1926. A study of the epizoology of the disease and the research work done in France, Germany, England, Denmark, Sweden, Holland, Belgium, Austria, Hungary, Switzerland and Italy was made, and in addition independent research was done at Strasbourg and Alfort, France.

A study of the epizoology of foot-and-mouth disease in Europe makes it quite apparent that the disease is on the increase and that methods of control have not kept pace with factors responsible for its dissemination.

Chart 1, showing the incidence of foot-and-mouth disease in Germany from 1886 to 1921, is more or less typical of most of the countries of continental Europe. It will be seen that while the disease is enzootic during this period, at certain intervals it assumes epizootic proportions, and that these epizootics, as time goes on, have been more extensive, the peak being reached in the period 1919-1921, when the most severe outbreak occurred, with the malignant type of the disease predominating in certain sections.

Table I shows the number of herds affected in *certain* countries of Europe for the years 1924 and 1925.

Table II shows the morbidity and mortality from the disease in Italy from 1909 to 1920.

With the exception of England, where the slaughter or stamping-out method is carried out, the disease is combated by isolation and quarantine.

*Presented at the sixty-fourth annual meeting of the American Veterinary Medical Association, Philadelphia, Pa., September 13-16, 1927.

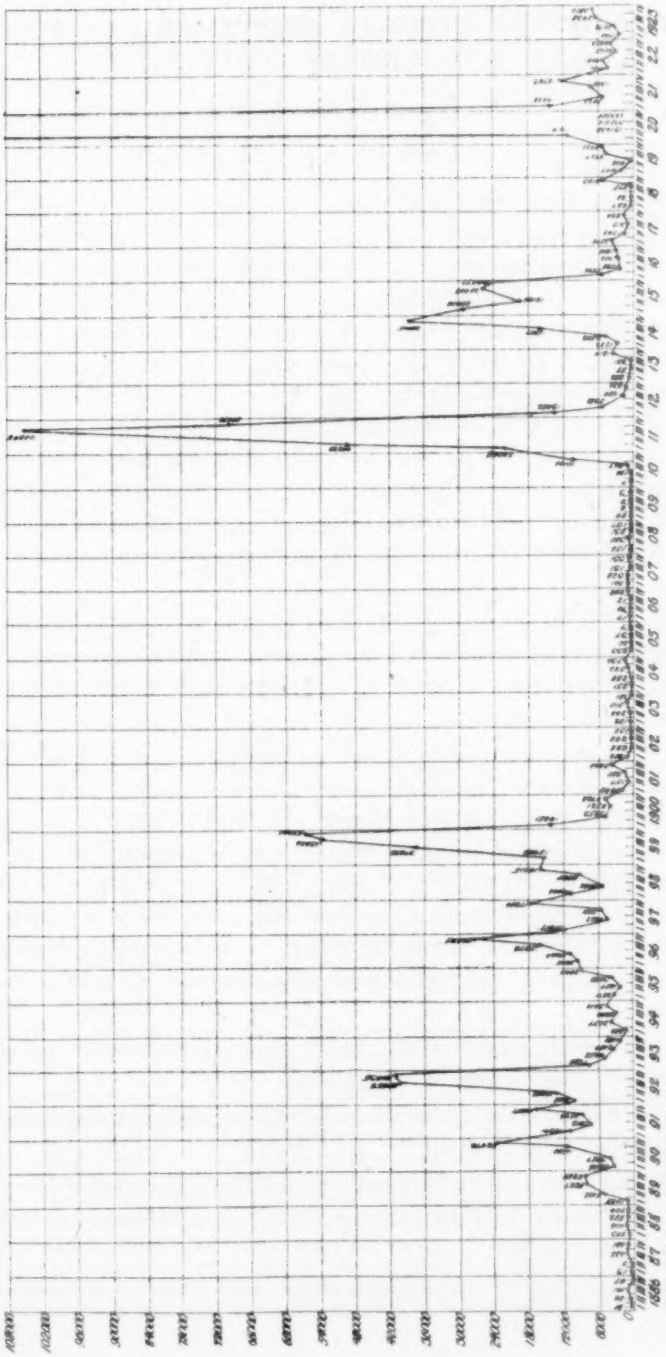

CHART 1. Foot-and-mouth disease in Germany from 1886 to 1923.

Many of the countries, however, have provisions for slaughter as a means of control and in some countries, notably Switzerland, this is carried out quite extensively, especially when the disease first breaks out and prospects are bright for its eradication by slaughter of primary herds infected.

TABLE I—*The number of outbreaks of foot-and-mouth disease in certain European countries for the years 1924 and 1925**

MONTH	GREAT BRITAIN	GERMANY	HOLLAND	BELGIUM	FRANCE	DENMARK
			1924			
January	582	1,897	211	436	2,181	2
February	308	2,188	369	500	1,697	16
March	215	2,838	2,397	755	1,633	26
April	65	1,148	4,746	1,172	936	23
May	33	1,124	9,419	1,506	754	10
June	59	1,224	14,914	1,654	1,012	2
July	73	1,710	22,581	3,016	2,426	5
August	57	3,363	20,692	5,116	3,326	6
September	9	3,749	7,757	4,835	1,945	14
October	16	4,961	3,420	7,166	2,020	122
November	19	5,985	1,224	6,318	1,057	1,383
December	4	6,112	1,200	4,813	825	6,332
Totals	1,440	36,299	88,930	37,287	19,812	7,941
			1925			
January	5	3,710	625	1,237	922	8,050
February	7	2,286	239	395	613	7,862
March	4	1,548	145	253	505	6,491
April	2	1,448	275	182	692	4,016
May	3	1,171	923	164	629	2,941
June	—	2,007	2,243	138	1,000	2,609
July	1	3,712	4,491	157	1,641	2,960
August	3	3,914	7,521	112	1,999	3,542
September	3	2,643	7,823	57	2,351	3,658
October	96	2,639	4,307	85	3,217	5,108
November	101	2,483	1,205	103	2,044	3,781
December	35	5,011	1,042	125	1,391	2,554
Totals	260	32,572	31,039	3,008	17,004	53,617

*These figures were obtained from Sir John M'Fadyean's report on foot-and-mouth disease to the Royal Agricultural Society of England. *Veterinary Record*, April 17, 1926.

It may be stated here that European authorities with whom we discussed this question were practically unanimous in the opinion that situated as we are in the United States, the slaughter method is for us the most practical and economical method of dealing with the disease.

THE DISEASE IN THE GUINEA PIG

The first research work of the Commission was directed to a study of the disease in the guinea pig.

It was found that guinea pigs are readily infected with most strains of foot-and-mouth disease virus by scarification or intradermic inoculations into the hairless pads of the hind limbs. In 24 to 48 hours a vesicle makes its appearance, followed 24 to 72 hours later by generalization of the disease, as evidenced by the formation of vesicles on the pads of the front feet and in some cases on the tongue. The virus is found in the blood 24 to 48 hours after inoculation, but its presence is only transitory. The mortality in guinea pigs as a rule is low and the recovered animals are immune to subsequent exposure to the same virus for a period of at least several months. While the guinea pig is easily infected by artificial inoculation, the disease is not transmitted naturally from one animal to another.

TABLE II—*Morbidity and mortality of foot-and-mouth disease in Italy for the years 1909 to 1920**

YEAR	ANIMALS INFECTED	ANIMALS DEAD OR SLAUGHTERED	PERCENTAGE
1909	53,475	680	1.2
1910	48,160	3,399	7.0
1911	869,698	13,721	1.5
1912	287,499	1,443	0.5
1913	650,160	11,113	1.7
1914	81,898	1,446	1.7
1915	189,739	10,324	5.4
1916	249,469	17,566	7.0
1917	150,910	13,659	9.0
1918	286,700	13,795	4.8
1919	1,313,320	86,434	6.0
1920	305,761	34,825	11.0

*These figures were furnished by Dr. Carlo Bisanti, Director of Federal Veterinary Service, Rome, Italy.

The susceptibility of the guinea pig to the virus of foot-and-mouth disease was first definitely shown by Waldmann and Pape[1] in 1920 and soon confirmed by others. The reports of earlier workers of their inability to transmit the disease to laboratory animals is rather difficult to explain and although Hecker,[2] in 1899, reported success in inoculating guinea pigs, his description of the disease in this species is not convincing.

The strain of virus used by us in our studies was passed through a series of 261 guinea pig passages without loss of virulence. This virus from guinea pigs readily induced the disease in cattle and hogs by local inoculation on the mucous membrane and by intravenous and intramuscular injection.

Rats and Rabbits

We were unable to transmit the disease to six white rats and four rabbits. However, Gins[3] and others, in the past few years, have reported the transference of the disease to both species, but not with regularity in the rat.

The Presence of the Virus in the Animal

The virus in infected animals is found in the fluid and coverings of the vesicles, in the blood during the febrile stage and at this time in the saliva, urine and milk. We have found the saliva of two cattle infectious before any visible lesions of the disease were observed. The virus dies rather quickly in the animal. Material taken by means of swabs from the mouths of infected cattle was active for guinea pigs for not longer than seven days after the first appearance of symptoms. In most cases, however, such materials were inactive after the fourth day. This suggests that the most infective stage of the disease is at its beginning, during the febrile period, when the virus is found in the blood and the various secretions and excretions. This is in accord with the recent findings of others.

The Virus Outside of the Body

With respect to the viability of the virus outside of the body, conditions under which it is kept determine in a large measure its resistance to destruction. In the laboratory at 37° C. the active agent dies within 24 to 48 hours. At room temperature we have kept the virus alive in artificial media longer than 69 days, but shorter than 100. In the cold the virus is preserved for months. The virus also resists desiccation, particularly if dried rapidly.

Our experiments on the viability of the virus under field conditions were limited. In one experiment we placed pieces of coverings from unruptured tongue vesicles of cows in a sack containing hay. After thirty days these tissues were still virulent, but not after fifty days. In soil virulent material remained active for at least twenty-five days.

Cultivation Experiments

Our attempts at cultivation of the virus were unsuccessful. Neither could we confirm the reported findings of Frosch and Dahmen, using their methods of technic. Frosch and Dahmen themselves have been unable to repeat their former work. In a study of the prerequisites for the survival of the virus in artificial

media, we found the optimum hydrogen-ion concentration to be pH 7.5 to 7.6, a strict anaerobic atmosphere to be favorable and the temperature less than 37° C.

In a semi-solid structure of medium, as .25 per cent agar or 10 per cent gelatin, the virus survived 69 days at room temperature. This simple medium appeared to be best suited for survival; the addition of organic matter or protein substances was harmful. No multiplication of the virus was found in vitro.

Physical and Chemical Properties of the Virus

Titration: The virus was found in several instances to be active in dilutions of 1 to 10,000,000 and it was observed generally that the period of incubation of the experimentally induced disease was proportional to the concentration of the virus.

Centrifugation: The virus could not be sedimented at 2500 to 3000 r. p. m. for two hours.

Size: The relative size of the incitant has been delimited, by a series of molecular filtration tests, in comparison with collargol and colloidal arsenic trisulphid, to be between 20 and 100 $\mu\mu$ in diameter, and by similar means and by cataphoresis experiments we have demonstrated that the virus is particulate.

Cataphoresis: The electric charge carried by the virus, as determined by cataphoresis, is positive, the isoelectric point being pH = about 8.

Filtration: The virus was regularly filtrable through Seitz asbestos disks and Berkefeld-V candles and Chamberland bougies L-1 to L-5. Some adsorption of the virus occurred in Berkefeld N and the Chamberland L-7 and L-9 bougies, while in the L-11 bougie it was completely retained. The virus being electropositive and the filters electronegative, adsorption occurred in the denser filters, due to oppositely charged materials. When the charge of the virus was changed to negative it readily passed through the Chamberland L-11 bougie.

Chemical Properties: The resistance of the virus to chemicals is well known. Twenty-five to fifty per cent alcohol does not destroy the virus after three days and it is quite resistant to the action of chloroform and ether.

In addition to alcohol, we have tested bichlorid of mercury and cresol and found the virus to be active after contact for six hours with these reagents in dilutions of 1-1000 and 3 per cent, respectively. We have explained the resistance of the virus to these chemicals on the basis of colloidal protection. In laboratory

tests of disinfectants they are added to pure cultures of bacteria in which the action is direct. In the case of the virus of foot-and-mouth disease, which is admixed with protein material, the chemicals cause a more or less heavy coagulation of protein tissue and these particles protect the virus from the action of disinfectants. If the coagulation is prevented, then the virus is as readily destroyed as ordinary bacteria. It was found that sodium hydrate in 1 to 2 per cent solutions, which cause no coagulation, destroyed the virus in one minute, even when mixed with urine, feces or garden soil. The high virucidal properties of this reagent suggest its practical use under field conditions.

Plurality of Types of Virus

We have confirmed the findings of Vallée and Carre[4] that there are at least two types of virus distinguished by their inability to cross-immunize. In cattle, swine and guinea pigs, the animals used, the disease produced by the two viruses is indistinguishable. We had a limited opportunity to study types of virus. Field evidence in Denmark and Sweden in 1926 indicated a plurality of the virus and at Strasbourg we were able to demonstrate experimentally, in material forwarded, such a plurality in these countries.

Immunity

Following an attack of foot-and-mouth disease, animals develop an immunity against the homologous type of the disease only, which persists for a variable time. While no special study of this subject was made, we are of the opinion, in agreement with others, that two types of immunity appear in foot-and-mouth disease, a local or tissue immunity and a general immunity. The tissue immunity is first to disappear, the animal again becoming susceptible to local infection, but the disease does not become generalized. In general, the duration of local immunity can be said to last six months or longer and general immunity eighteen months or more. The duration of immunity, as reported, varies between several weeks and years.

Artificial Immunity

Active immunity: The preparation of an immunizing agent that will produce an active immunity without danger of inducing the disease has been the goal of all workers on foot-and-mouth disease. Despite a large amount of work on this problem by workers in various countries, such an immunizing agent has not as yet been found.

Passive immunity: Hyperimmune serum developed through the research work of Loffler is used quite extensively in the treatment of the disease in Europe. The immunity induced by this serum is of such short duration (from 8 to 14 days) that it has little practical use as a prophylactic. It has given beneficial results, however, when used in the treatment of the disease. Serum taken from cattle a short time after recovery also is used with good results in lessening the severity of the disease.

Serum Tests

The serum of an animal collected a short time after recovery from foot-and-mouth disease contains antibodies that are specific for the type of virus responsible for the disease. These antibodies can be detected by means of guinea pig tests. Guinea pigs inoculated with serum and at the same time exposed to virus by scarification of the pads of the hind legs are protected against the formation of secondary lesions if the specific antibodies are present in the serum in sufficient quantities. The serum test can be employed in the typing of viruses and also in titrating immune and hyperimmune serums.

Carriers

Field evidence that the carrier in foot-and-mouth disease exists is quite strong, although the percentage of such animals is considered to be small. Observations that such carriers exist have been made in practically all countries where the disease is enzootic, although strong experimental evidence is somewhat meager. It is believed that the virus in such carriers may be retained in the hoof or other parts of the body as the skin. The hoof, however, is generally held to be the usual seat of the virus and when the old horn is worn down or cut away the virus escapes. Animals have been incriminated as carriers up until two years after infection. Most of the outbreaks from carriers occur before the eighth month after recovery.

This problem was studied experimentally at Alfort, France. Twenty cattle, recovered from foot-and-mouth disease and especially selected by Swiss officials as probable virus-carriers, were exposed to thirty-five normal cattle and four normal swine for a period of three to four months, with the result that the normal animals remained healthy. The susceptibility of the normal animals to foot-and-mouth disease was later proved by their inoculation with both O and A types of virus.

The hoofs of twenty-two cattle and one hog were examined at postmortem twenty days to six months after onset of the disease. The hoofs were sectioned with a saw and scrapings of double soles and loose horn tissue were inoculated into guinea pigs.

One positive result was obtained in a cow thirty-four days after onset of the disease.

Complement-fixation tests using immune and hyperimmune serums against antigens made from various tissues were uniformly negative.

A comparative study was made between vesicular stomatitis and foot-and-mouth disease. A marked similarity was found in the two diseases, the distinguishing features being a lack of cross-immunity and the susceptibility of the horse to vesicular stomatitis and its resistance to both types of foot-and-mouth disease. Attempts at artificial immunization were unsuccessful.

In conclusion it may be stated that up to the present time the virus of foot-and-mouth disease has not been cultivated, neither has a practical method of immunization been found by which the disease can be controlled and the enormous losses it causes reduced.

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DISCUSSION

DR. WARD GILTNER: Are there differences in resistance to physical and chemical agencies between the viruses of foot-and-mouth disease and vesicular stomatitis? Is it positively known that the secretion of the salivary glands carries the virus and may it not be derived from the epithelium of the mouth, as has been suggested? Is this epithelium analogous to anthrax in its susceptibility?

DR. SCHOENING: I will answer the last question first. I believe that it is. That is, there are two types of immunity, the tissue immunity and blood immunity. As far as concerns the presence of the virus in saliva, it is a question as to where it comes from. Whether it comes from the epithelial tissue of the mouth or is secreted by the salivary glands or not I do not know. I am not in a position to say, but we do know that urine is infectious at a certain time, that the milk is infectious at a certain time, and that the saliva may be infectious before any visible lesions appear. No experiments have been carried out on the comparison of the susceptibility of the two viruses and I am not able to say just how they compare.

DR. GILTNER: Can you explain why it is that the vesicular stomatitis, which we have in this country, so closely related to the other disease biologically, does not cause us great trouble? I assume that it does not.

DR. SCHOENING: Well, I think the difference between vesicular stomatitis and foot-and-mouth disease is more a question of infectiousness. Vesicular stomatitis apparently is not so infectious as foot-and-mouth disease.

Now, as far as the actual damage vesicular stomatitis does, as compared with foot-and-mouth disease, I do not think they are equal, but vesicular stomatitis does cause considerable damage to the individual animal. I understand that in the past year, or year and a half, they had an outbreak of vesi-

cular stomatitis in New Jersey which I believe was the worst that they have seen in this country in recent years. Dr. Cotton, who investigated it, said they had two or three animals die, and he never saw the animals hit so hard as they were with this particular strain that was operating.

By the way, that also was a different strain from the one that appeared in Indiana, a year or two previously. There is more than one strain of the virus of foot-and-mouth disease, and the same holds true of vesicular stomatitis.

Dr. A. Eichhorn: From my own experience, in investigating an outbreak of vesicular stomatitis at the Kansas City stockyards, in 1916, we found, in one single pen which contained about 56 steers, 47 infected animals. The disease was of a very acute form, with lesions such as would occur in the worst type of foot-and-mouth disease, yet, in the adjoining pen, the animals being in actual contact with the infected cases, we did not find any vesicular stomatitis after observing these animals for 25 days. That may explain why we do not get such outbreaks of stomatitis as we do with foot-and-mouth disease.

Dr. L. E. Day: Referring to the outbreak of vesicular stomatitis in the Kansas City stockyards which Dr. Eichhorn referred to, I had the privilege of examining the first shipment of infected cattled received in the Kansas City stockyards, also tracing them back to the farms from which they came. Some came from Tescot, Kansas, and the remainder came from Wauneta, Nebraska. At both of these points a large number of horses as well as cattle were affected. My observation in this outbreak confirms what Dr. Eichhorn has just said—that vesicular stomatitis in cattle is not so contagious as foot-and-mouth disease. In foot-and-mouth disease practically all of the cattle become affected, while in vesicular stomatitis only 10 to 25 per cent will become affected, unless the animals are concentrated in large numbers. Then the disease appears to take a more virulent form. During the year 1916 a large number of horses were purchased and concentrated at points through the West and Middle West by various countries engaged in war at that time. Vesicular stomatitis broke out in a few of the horses and spread rapidly to a large percentage of them in some of the concentration points, also to the horses on the farms in the vicinity, and from these horses to the cattle on the same farms. The outbreak at Wauneta, Nebraska, appeared in horses first then spread to the cattle. The infection appeared to have been introduced into the neighborhood from Denver, Colorado.

ANOTHER PENNSYLVANIA VETERINARIAN HONORED

During the State Farm Products Show, held at Harrisburg, Pa., in January, the degree of Master Farmer was conferred upon Dr. Frederick Taylor, of Pulaski, Lawrence County, Pa., by the *Pennsylvania Farmer*. Dr. Taylor is a graduate of the University of Pennsylvania School of Veterinary Medicine and practiced in Sewickley, Pa., a good many years. He is now producing certified milk at his Everglad Dairy Farm, consisting of 230 acres, of which 120 acres are under cultivation. The dairy consists of 40 cows at the present time. Three distributing concerns dispose of the milk that is produced on this farm, in three different towns. The quality of the milk produced by Dr. Taylor may be judged by the fact that last summer his average bacterial count did not exceed 700 per cubic centimeter. On four different occasions he won the Allegheny County Medical Milk Commission first prize for the high quality of his product.

BACTERIUM VISCOSUM EQUI. A FACTOR IN JOINT-ILL AND SEPTICEMIA IN YOUNG FOALS*

By W. W. Dimock, Philip R. Edwards *and* J. F. Bullard

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Navel-ill, joint-ill and pyosepticemia in young foals have been recognized as due to streptococci, diplococci, *Bact. coli*, various pyogenic organisms, *Bacillus abortivo-equinus* and *Bacterium viscosum equi*. Although infection due to *Bact. viscosum equi* has been recognized as existing in Europe for more than twenty years, it is only within the past decade that its significance and importance as a factor in the diseases of young foals have been brought out in full.

Bact. viscosum equi was first isolated and positively identified in the United States in the laboratory of the Department of Veterinary Science of the Kentucky Experiment Station, April 27, 1922, from a twenty-four-hour foal recorded as No. 1236. The first published report of the presence of this organism in the United States was by Snyder,[1] from this laboratory, in 1925. Good and Smith,[2] working on abortion in mares, at the Kentucky Experiment Station, in 1914, recovered from a case of joint-ill in a colt an organism which from their description possessed cultural characteristics of *Bact. viscosum equi*.

During the years prior to January 1, 1926, postmortem examinations were held on thirty-six foals. In only four foals was *Bact. viscosum equi* recognized as the cause of death. Since January 1, 1926, however, *Bact. viscosum equi* has increased in importance as a factor in the diseases of young foals, until at present disease due to this organism has reached alarming proportions. During the years 1926 and 1927, we have held postmortem examinations on fifty-nine foals. In seven of these cases death was attributable to traumatic injuries or dystocia. Of the remaining fifty-two, twenty-nine (58 per cent) were found to be suffering with infection due to *Bact. viscosum equi*. From each of these twenty-nine cases the causative organism was isolated and positively identified.

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January 1, 1920, to December 31, 1925

Total foals	36
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In seven of the sixteen negative foals, death was due to traumatic injury or dystocia. In computing the percentage of infection due to *Bact. viscosum equi*, these seven are not included in the total.

Fifty-eight per cent of the corrected total of 52 were infected with viscosum.

Average age at death—29.7 days.

If seven foals dying at ages of 42, 60, 120, 135, 138, 150 and 165 days are excluded, the average at death of the remaining 22 foals is 2.9 days.

Infection due to *Bacterium viscosum equi* is characterized by sudden onset, extreme prostration, short duration after appearance of symptoms of disease, and death. During the course of the disease the pulse, respiration and temperature are usually increased. Lameness may be pronounced and one or more joints of the legs often are visibly enlarged. Pathological changes are severe and rather uniform in extent and distribution, a typical case showing purulent arthritis, nephritis (often with multiple focal necrosis) and septicemia.

All methods of prevention and cure so far attempted have failed to prove reasonably effective. The use of the dam's blood by direct intravenous transfusion or subcutaneous injection has been practiced extensively in European countries with rather uncertain results. Great hope had been placed in this method of treatment. In the few cases in Kentucky where the dam's blood was used, the results have been less favorable than might be expected from the reports in European literature. In all cases where the symptoms were sufficiently developed to make the diagnosis reasonably accurate, the use of the dam's blood did not prevent the death of the foal. In those cases where the foals so treated lived, the symptoms of sickness were not such as to make the diagnosis of *Bact. viscosum equi* infection at all accurate. In many cases of infection in newborn foals it is practically impossible in the early stages to distinguish between *Bact. viscosum equi* and other infections. Further, it is not uncommon

for newborn foals to be subnormal in physical vigor from causes other than infection and later become perfectly normal with or without treatment.

Dr. M. G. Fincher, of the New York State Veterinary College, Cornell University, who, during the last year, has been resident veterinarian for Himyar and Shoshone Studs, Lexington, Kentucky, treated eight foals with dam's blood during the spring of 1927. All were treated at the age of one to two days, some repeatedly. The total amount of dam's blood received by each foal varied from 100 to 500 cc. The blood was drawn from the jugular vein and transferred directly to the foal by subcutaneous injection. Of the eight foals treated, four died and four are still living. Of the four that died, three died at the ages of 2, 6 and 10 days, respectively. The fourth died at the age of 165 days. All four showed typical lesions of the disease on postmortem examination and *Bact. viscosum equi* was isolated in each case. The 165-day foal had a history of infection at birth. Of the four foals treated and still alive, all showed symptoms of infection at birth. Following injection of the dam's blood, improvement was rapid and apparently complete. In the case of one, symptoms of arthritis developed some weeks later but it has since recovered and is apparently normal at present. It should be stated that all of the eight foals treated with dam's blood also received antistreptococcic serum.

Dr. Charles Hagyard, of Lexington, also made use of this method of treatment. We have a complete record of only one foal treated by Dr. Hagyard. In this case the foal was two days old and unable to stand at the time of treatment. Death occurred four or five hours after the injections were made. On postmortem examination extensive lesions of the disease were found and the microorganism was isolated from the joints and various organs of the body.

Most of the cases studied were foals which lived for only 24 to 96 hours. In ten foals dying at 24 to 48 hours of age, only one showed visible focal necrosis in the kidney. Of seven foals dying at 72 to 96 hours of age, all but one showed well-developed areas of focal necrosis in the kidney. From this it seems that the abscesses in the kidney do not become macroscopic until some time after birth. On the other hand it hardly seems possible that lesions of this size could have developed in from 72 to 96 hours. Some of the foals that died at the age of three days had as large and as well-developed lesions of multiple focal necrosis

in the kidneys and as much exudate in the joints as any that were examined.

Foals from which the organism has been isolated and which showed characteristic lesions may be classified roughly as follows:

1. Those dead at birth or showing characteristic symptoms at birth but in a semi-comatose condition—the type commonly called "sleeper."

2. Those showing symptoms of sickness at birth but more or less active.

3. Those apparently normal at birth but developing characteristic symptoms at second or third day. Death may be sudden or delayed.

4. Those apparently normal at birth but developing the disease, six weeks to five months later. Death may be sudden, in one to twenty-four hours, or delayed one to three weeks.

In practically all cases of viscosum infection in new-born foals there is unmistakable evidence of prenatal infection. In seven older foals it was apparent from the character of the lesions that infection had been present for some time. In three cases of the older foals, aged 42, 125 and 150 days, respectively, from which *Bact. viscosum equi* was isolated, there was substantial evidence to support a prenatal infection. In the four remaining cases the foals were 60, 120, 138 and 165 days old, respectively. The location and distribution of the lesions were not so suggestive of prenatal infection as in case of the first three mentioned, however, in size and character the lesions were typical of the disease.

Gross Pathology

In the past two years, twenty-nine postmortem examinations have been performed in which *Bact. viscosum equi* was recovered. The predominating gross pathological changes were confined to the kidneys and joints. In general the kidneys were somewhat firmer than normal. The capsule peeled easily, with no evidence of abnormal attachments.

The cut surface of both the cortex and the medulla is usually abnormally dark in color and shows congestion, hemorrhage and inflammation. In the medullary portion and particularly in the pelvis is found an accumulation of a glistening mucous exudate, very tenacious in consistency and often blood-stained. Throughout the cortical portion and standing out in sharp contrast to the dark background, are small multiple abscesses or areas of necrosis. These areas are of a grayish or very light brown

color and vary in size from one to three millimeters. They are remarkably uniform in size and distribution in the same kidney but vary considerably in different kidneys. There is a rather definite line of demarcation between the diseased area and the surrounding kidney tissue.

The distribution of the necrotic areas is consistently uniform with the glomerular structures of the kidney. All this seems to show that the condition is primarily a glomerulo-nephritis followed by suppuration and necrosis. Uniformity in size and distribution of the diseased areas indicates an independent origin and simultaneous distribution of the infection to each of the diseased foci in each individual kidney. In only one or two cases have we found a kidney in which there was a noticeable difference in size and distribution of the areas of necrosis and in only two cases did we find a single large, irregular, diseased area.

In one of the two latter cases (42-day-old foal) the diseased area was elliptical in outline and approximately 1 x 3 centimeters in size. It was located at the margin of the renal hilus and extended from the surface through the cortex well into the medulla. The diseased area was grayish white in color and had become well organized through the ingrowth of connective tissue.

In the other of the two latter cases (138-day foal) the lesion was located in the anterior half of the right kidney, beginning at the rounded margin of the renal hilus and extending along the cortical portion to the renal sinus. The lesion was in two rather distinct parts and at two points extended well down into the medullary portion. One part of the lesion was firm and fibrous, the other had the consistency of inspissated pus and showed a well-defined capsule. The lesion as a whole was very irregular in outline having an average diameter of approximately four centimeters.

The joints of the legs are quite as often affected as are the kidneys; however, there is a much wider range of pathological change which makes a postmortem interpretation more difficult. In many instances culture tubes inoculated from the joint cavity are positive to *Bact. viscosum equi* when the gross evidence of disease in the joint is practically nil. The articular cartilages usually are normal. The joint capsule shows congestion even in the mildest type of cases. Further, the majority of the joints of all four legs may show evidence of disease to a mild or marked degree, the other extreme being that one joint will show purulent arthritis, while all the other joints of the legs appear normal and

may be negative on culture. In mild cases the synovial fluid shows only a slight increase in viscosity and quantity and a somewhat darker color. Air bubbles may be present.

In the more extreme cases a large amount of fluid is present, which is very characteristic of this infection. Upon opening the joint cavity the fluid pours out with considerable force. This exudate may vary in color from a light golden yellow to dark amber, and in those cases where the exudate is decidedly purulent in character it often has a dirty brownish color. Air bubbles usually are present and give the exudate a frothy appearance. It is always extremely viscid and tenacious in consistency and usually contains small flocculi; less often strings and tangled masses of coagulated mucus and fibrin.

In our experience the hock, hip and knee joints have more often been involved than other joints of the legs. The tendon-sheaths over the affected joint become greatly distended through the accumulation of an exudate which resembles serum. It is only slightly cloudy and contains a few pus cells. In a few cases this fluid has seen collected in the early stages of the disease for bacteriological examination but was negative on culture. Later, in the same foal, the exudate in the tendon-sheaths and structures adjacent to the joint becomes purulent in character, of a very dark amber or brownish color, decidedly sticky and viscid in consistency and proves positive on culture. It seems quite probable that these latter structures become involved through direct invasion from the joint and not through the general circulation.

In many cases, and particularly in the young foals, lesions of a general septicemia are strikingly evident. The heart and surrounding structures are distinctly hemorrhagic, the lymph-glands congested, the liver showing evidence of degeneration and occasionally somewhat mottled, and the spleen enlarged and hemorrhagic. In a few cases peritonitis has been a prominent lesion, while others have shown an extreme purulent pleuropneumonia, the pleural cavity containing a large quantity of a purulent exudate.

Microscopic Pathology

The pathological changes found upon microscopic examination of tissues are exactly what would be expected from the appearance of organs on gross examination. The lesions vary considerably in each individual case; however, this variation apparently

represents stages of development rather than a definite variation in type.

The heart, liver and spleen often show congestion, hemorrhage, cellular degeneration and, occasionally, cellular infiltration but with little or no tendency to abscess formation and necrosis. In the more chronic cases of older foals, where septicemia and pyemia are evident on both clinical and postmortem examination, it is assumed that organs and structures other than the kidneys would show areas of suppuration and necrosis. Tissues from cases of this kind have not so far been studied histologically.

On gross examination the kidneys from colts dying from *Bact. viscosum equi* infection can readily be divided into those that show multiple areas of focal necrosis throughout the cortex and those that show only general acute nephritis. The latter, on section, show congestion, hemorrhage, inflammation and acute parenchymatous degeneration in both the cortex and medulla. In the glomeruli are observed all the changes of an acute inflammation. In sections from kidneys showing focal necrosis on gross examination, the typical cortical purulent foci are very pronounced and are found uniformly scattered through the cortex of the kidney. Each area consists of an accumulation of polymorphonuclear leucocytes and broken-down tissue elements, the normal structures being completely obliterated and replaced by the products of inflammation and degeneration. A study of numerous sections from the same and from different kidneys, showing all stages of inflammation and degeneration, gives evidence that infection of the kidney causes primarily an acute glomerular nephritis and cellular degeneration.

The fact that in practically every case of viscosum infection in foals the kidney is positive to the bacterium on culture, regardless of the extent of the pathological changes observed, seems to be ample proof that the microorganism usually finds its way to the kidney early in the course of the disease and is a primary factor as a cause of the nephritic changes that are found to be so characteristic of the disease.

Morphology and Staining

Bact. viscosum equi is a small oval bacillus 1.5 to 2 times as long as it is broad. The average length is 1.6 to 1.8 microns. Thread or coccus-like forms are seldom noticed in smear preparations. The organism stains easily with the ordinary anilin dyes, is Gram-negative and non-acid-fast. No capsules have

been demonstrated. The bacterium is non-motile and does not form spores.

Cultural Characteristics

The organism grows well on the ordinary culture media. A moderately abundant growth is present after incubation for 18 to 24 hours. Magnusson[3] characterizes the agar colonies of the bacterium as follows:

> On agar plates the colonies are very characteristic, being semi-solid and not easily separated. They are tough and ropy. When one tries to transfer them the whole colony comes along with the needle. They are grayish white in color. The submerged colonies are smaller than the surface ones. They are spherical and when slightly magnified ..... they show a darker central part, which is often stellate. The surface colonies are a little flattened but are, nevertheless, almost hemispherical. They are of a mucoid, glossy, gray color and under the microscope have a darker nucleus and a wide clear border zone.

While this description is correct, several facts may well be added. The viscosity of *Bact. viscosum equi* is not to be confused with that of the encapsulated bacilli of the *Bacterium mucosus* type. While the encapsulated *Bact. mucosus* type bacilli present an exceedingly moist, mucoid and rather spreading growth, *Bact. viscosum equi* presents a much dryer appearance. The colonies are actually tough and resist transfer, the loop sliding over the surface without picking up a visible amount of growth. On plates or slants where the colonies are well isolated and attain considerable size (1.3 to 5 mm. in diameter), the surface of the colonies become markedly changed. Instead of a smooth, glossy surface they appear dry and the surface of the colony is roughened. When examined under a hand lens they present a lobulated appearance, the small lobular projections occurring irregularly over the entire surface of the colony which is rounded and almost hemispherical.

We have noticed that when the bacterium is grown in an artificial medium for some length of time it tends to lose the viscous form of growth possessed when it is first isolated. The length of time elapsing after isolation before this change takes place varies with different strains of the bacterium. The viscosity of the growth of this organism is apparently not due to capsule formation. We have not, as yet, determined why this change takes place.

At times organisms have been recovered from young foals which were identical with *Bact. viscosum equi* except that they did not possess the viscous growth form generally possessed by this organism. Since the foals showed postmortem lesions char-

acteristic of *Bact. viscosum equi*, and the organisms recovered were identical with *Bact. viscosum equi* in every respect, they have been considered to be a typical strain of the bacterium.

One of the most marked peculiarities of the organism is exhibited when grown on the surface of agar slants. When growing on this medium the organism will not remain viable for more than eight to ten days, when held at room temperature. In gelatin or chopped-meat medium the organism will persist for three or four months without transfer. However, in carrying stock cultures on agar slants, it is necessary that they be transferred every six or seven days.

In gelatin at 20° C., a nailhead growth appears. In gelatin incubated at 37° C., very small colonies develop throughout the tube. No liquefaction occurs.

In bouillon the organism grows readily. A rather heavy, ropy sediment appears. There is usually a thin, filmy membrane at the surface. Small, gray flocculi appear along the sides of the tube and the whole mass appears more or less viscous.

The organism grows slowly in milk, producing acidity without coagulation. Slime is formed in all media which support growth. Indol is not formed. Hematoxins are not produced.

Dextrose, lactose, saccharose, maltose, raffinose, mannite and galactose are fermented. Arabinose, adonitol and dulcitol are not attacked.

Pathogenicity

Bact. viscosum equi is almost completely non-pathogenic for rabbits, guinea pigs and rats. When the organisms are administered in moderately large doses, no ill effects are noted. When extremely large doses are administered intraperitoneally or intravenously, death may result within twenty-four hours or the animal may be partially paralyzed. However, to produce these effects it is necessary to employ enormous doses and most workers have considered the organism as being non-pathogenic for laboratory animals.

The organism is highly virulent for young foals. Following subcutaneous injection of a living culture, the site of injection swells rapidly and an abscess is formed. The temperature rises, the foal becomes stiff and sore and lies down the greater part of the time. Septicemia develops and the colt usually dies in the third or fourth day following injection. Large numbers of the organism can be recovered from the internal organs and joints.

As the age of the colt increases, it apparently becomes more resistant to infection through injection of the organism. In yearlings, subcutaneous and intravenous injections of the organisms are followed by a severe local and systemic reaction and general arthritis. None of the yearlings used for experimental inoculation died during the six weeks and two months that they were kept under observation. When adult horses are injected subcutaneously, there is a severe reaction at the point of injection. The site of injection becomes swollen and inflamed and later an abscess forms. In the course of four to seven days, the abscess will rupture and discharge a thick, viscid, purulent fluid. The local reaction is accompanied by general depression and stiffness of the joints. After four to five days, the condition of the horse returns to normal, with the exception of the local reaction. The abscess heals slowly and the animal completely recovers.

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[3]Magnusson, H.: Jour. Comp. Path. & Therap., xxxii (1919), p. 143.

GRADING SMALL-ANIMAL HOSPITALS*

By J. V. LACROIX, *Evanston, Ill.*

During recent years I have had occasion to give thought to the hospitalization of small animals and to observe the result of my attempts at doing this work in a satisfactory manner. I have also noted the methods employed by many others, in different cities, both among veterinary practitioners with experience and those who were beginning the work. It has been interesting to the point of fascination, but the work of evolving a satisfactory plan for the functioning of an efficient staff and building and equipping a suitable hospital has cost much effort.

It has been my privilege to observe the methods of others, as stated, and as with other practitioners of experience, I have been made aware of the lamentable shortcomings that exist rather generally in hospitalizing small animals. This statement may be made without discrediting those who conduct hospital work and practice in an efficient and satisfactory manner. But, because of the lack of standards and because of no encouraging and restraining influence, there are today scores of establishments operating as hospitals for small animals that are a disgrace to our profession, a handicap, in some instances, to those who operate them and a bad influence on small-animal practice generally. In many places, veterinarians with no particular training for the work, without sufficient ambition or initiative to adopt that which has been proved meritorious in small-animal practice, have occupied store-rooms that are devoid of provisions for sanitation and lacking almost every convenience for doing creditable work, and with little else but a sign designating the place, "dog and cat hospital," the veterinarian responsible assumes the title, "canine specialist."

This obviously tends to discourage dog-owners from seeking efficient veterinary service where such is available and it is largely responsible for the classification of the small-animal hospital as a nuisance when, instead, the properly managed hospital for animals actually renders a civic and humane service to the community in which it is located. The small-animal hospital should be encouraged and not legislated against, as it has been, for example, at Miami, Florida.

*Presented at the sixty-fourth annual meeting of the American Veterinary Medical Association, Philadelphia, Pa., September 13-16, 1927.

cular stomatitis in New Jersey which I believe was the worst that they have seen in this country in recent years. Dr. Cotton, who investigated it, said they had two or three animals die, and he never saw the animals hit so hard as they were with this particular strain that was operating.

By the way, that also was a different strain from the one that appeared in Indiana, a year or two previously. There is more than one strain of the virus of foot-and-mouth disease, and the same holds true of vesicular stomatitis.

DR. A. EICHHORN: From my own experience, in investigating an outbreak of vesicular stomatitis at the Kansas City stockyards, in 1916, we found, in one single pen which contained about 56 steers, 47 infected animals. The disease was of a very acute form, with lesions such as would occur in the worst type of foot-and-mouth disease, yet, in the adjoining pen, the animals being in actual contact with the infected cases, we did not find any vesicular stomatitis after observing these animals for 25 days. That may explain why we do not get such outbreaks of stomatitis as we do with foot-and-mouth disease.

DR. L. E. DAY: Referring to the outbreak of vesicular stomatitis in the Kansas City stockyards which Dr. Eichhorn referred to, I had the privilege of examining the first shipment of infected cattled received in the Kansas City stockyards, also tracing them back to the farms from which they came. Some came from Tescot, Kansas, and the remainder came from Wauneta, Nebraska. At both of these points a large number of horses as well as cattle were affected. My observation in this outbreak confirms what Dr. Eichhorn has just said—that vesicular stomatitis in cattle is not so contagious as foot-and-mouth disease. In foot-and-mouth disease practically all of the cattle become affected, while in vesicular stomatitis only 10 to 25 per cent will become affected, unless the animals are concentrated in large numbers. Then the disease appears to take a more virulent form. During the year 1916 a large number of horses were purchased and concentrated at points through the West and Middle West by various countries engaged in war at that time. Vesicular stomatitis broke out in a few of the horses and spread rapidly to a large percentage of them in some of the concentration points, also to the horses on the farms in the vicinity, and from these horses to the cattle on the same farms. The outbreak at Wauneta, Nebraska, appeared in horses first then spread to the cattle. The infection appeared to have been introduced into the neighborhood from Denver, Colorado.

ANOTHER PENNSYLVANIA VETERINARIAN HONORED

During the State Farm Products Show, held at Harrisburg, Pa., in January, the degree of Master Farmer was conferred upon Dr. Frederick Taylor, of Pulaski, Lawrence County, Pa., by the *Pennsylvania Farmer*. Dr. Taylor is a graduate of the University of Pennsylvania School of Veterinary Medicine and practiced in Sewickley, Pa., a good many years. He is now producing certified milk at his Everglad Dairy Farm, consisting of 230 acres, of which 120 acres are under cultivation. The dairy consists of 40 cows at the present time. Three distributing concerns dispose of the milk that is produced on this farm, in three different towns. The quality of the milk produced by Dr. Taylor may be judged by the fact that last summer his average bacterial count did not exceed 700 per cubic centimeter. On four different occasions he won the Allegheny County Medical Milk Commission first prize for the high quality of his product.

BACTERIUM VISCOSUM EQUI. A FACTOR IN JOINT-ILL AND SEPTICEMIA IN YOUNG FOALS*

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In practically all cases of viscosum infection in new-born foals there is unmistakable evidence of prenatal infection. In seven older foals it was apparent from the character of the lesions that infection had been present for some time. In three cases of the older foals, aged 42, 125 and 150 days, respectively, from which *Bact. viscosum equi* was isolated, there was substantial evidence to support a prenatal infection. In the four remaining cases the foals were 60, 120, 138 and 165 days old, respectively. The location and distribution of the lesions were not so suggestive of prenatal infection as in case of the first three mentioned, however, in size and character the lesions were typical of the disease.

Gross Pathology

In the past two years, twenty-nine postmortem examinations have been performed in which *Bact. viscosum equi* was recovered. The predominating gross pathological changes were confined to the kidneys and joints. In general the kidneys were somewhat firmer than normal. The capsule peeled easily, with no evidence of abnormal attachments.

The cut surface of both the cortex and the medulla is usually abnormally dark in color and shows congestion, hemorrhage and inflammation. In the medullary portion and particularly in the pelvis is found an accumulation of a glistening mucous exudate, very tenacious in consistency and often blood-stained. Throughout the cortical portion and standing out in sharp contrast to the dark background, are small multiple abscesses or areas of necrosis. These areas are of a grayish or very light brown

color and vary in size from one to three millimeters. They are remarkably uniform in size and distribution in the same kidney but vary considerably in different kidneys. There is a rather definite line of demarcation between the diseased area and the surrounding kidney tissue.

The distribution of the necrotic areas is consistently uniform with the glomerular structures of the kidney. All this seems to show that the condition is primarily a glomerulo-nephritis followed by suppuration and necrosis. Uniformity in size and distribution of the diseased areas indicates an independent origin and simultaneous distribution of the infection to each of the diseased foci in each individual kidney. In only one or two cases have we found a kidney in which there was a noticeable difference in size and distribution of the areas of necrosis and in only two cases did we find a single large, irregular, diseased area.

In one of the two latter cases (42-day-old foal) the diseased area was elliptical in outline and approximately 1 x 3 centimeters in size. It was located at the margin of the renal hilus and extended from the surface through the cortex well into the medulla. The diseased area was grayish white in color and had become well organized through the ingrowth of connective tissue.

In the other of the two latter cases (138-day foal) the lesion was located in the anterior half of the right kidney, beginning at the rounded margin of the renal hilus and extending along the cortical portion to the renal sinus. The lesion was in two rather distinct parts and at two points extended well down into the medullary portion. One part of the lesion was firm and fibrous, the other had the consistency of inspissated pus and showed a well-defined capsule. The lesion as a whole was very irregular in outline having an average diameter of approximately four centimeters.

The joints of the legs are quite as often affected as are the kidneys; however, there is a much wider range of pathological change which makes a postmortem interpretation more difficult. In many instances culture tubes inoculated from the joint cavity are positive to *Bact. viscosum equi* when the gross evidence of disease in the joint is practically nil. The articular cartilages usually are normal. The joint capsule shows congestion even in the mildest type of cases. Further, the majority of the joints of all four legs may show evidence of disease to a mild or marked degree, the other extreme being that one joint will show purulent arthritis, while all the other joints of the legs appear normal and

may be negative on culture. In mild cases the synovial fluid shows only a slight increase in viscosity and quantity and a somewhat darker color. Air bubbles may be present.

In the more extreme cases a large amount of fluid is present, which is very characteristic of this infection. Upon opening the joint cavity the fluid pours out with considerable force. This exudate may vary in color from a light golden yellow to dark amber, and in those cases where the exudate is decidedly purulent in character it often has a dirty brownish color. Air bubbles usually are present and give the exudate a frothy appearance. It is always extremely viscid and tenacious in consistency and usually contains small flocculi; less often strings and tangled masses of coagulated mucus and fibrin.

In our experience the hock, hip and knee joints have more often been involved than other joints of the legs. The tendon-sheaths over the affected joint become greatly distended through the accumulation of an exudate which resembles serum. It is only slightly cloudy and contains a few pus cells. In a few cases this fluid has seen collected in the early stages of the disease for bacteriological examination but was negative on culture. Later, in the same foal, the exudate in the tendon-sheaths and structures adjacent to the joint becomes purulent in character, of a very dark amber or brownish color, decidedly sticky and viscid in consistency and proves positive on culture. It seems quite probable that these latter structures become involved through direct invasion from the joint and not through the general circulation.

In many cases, and particularly in the young foals, lesions of a general septicemia are strikingly evident. The heart and surrounding structures are distinctly hemorrhagic, the lymph-glands congested, the liver showing evidence of degeneration and occasionally somewhat mottled, and the spleen enlarged and hemorrhagic. In a few cases peritonitis has been a prominent lesion, while others have shown an extreme purulent pleuropneumonia, the pleural cavity containing a large quantity of a purulent exudate.

Microscopic Pathology

The pathological changes found upon microscopic examination of tissues are exactly what would be expected from the appearance of organs on gross examination. The lesions vary considerably in each individual case; however, this variation apparently

represents stages of development rather than a definite variation in type.

The heart, liver and spleen often show congestion, hemorrhage, cellular degeneration and, occasionally, cellular infiltration but with little or no tendency to abscess formation and necrosis. In the more chronic cases of older foals, where septicemia and pyemia are evident on both clinical and postmortem examination, it is assumed that organs and structures other than the kidneys would show areas of suppuration and necrosis. Tissues from cases of this kind have not so far been studied histologically.

On gross examination the kidneys from colts dying from *Bact. viscosum equi* infection can readily be divided into those that show multiple areas of focal necrosis throughout the cortex and those that show only general acute nephritis. The latter, on section, show congestion, hemorrhage, inflammation and acute parenchymatous degeneration in both the cortex and medulla. In the glomeruli are observed all the changes of an acute inflammation. In sections from kidneys showing focal necrosis on gross examination, the typical cortical purulent foci are very pronounced and are found uniformly scattered through the cortex of the kidney. Each area consists of an accumulation of polymorphonuclear leucocytes and broken-down tissue elements, the normal structures being completely obliterated and replaced by the products of inflammation and degeneration. A study of numerous sections from the same and from different kidneys, showing all stages of inflammation and degeneration, gives evidence that infection of the kidney causes primarily an acute glomerular nephritis and cellular degeneration.

The fact that in practically every case of viscosum infection in foals the kidney is positive to the bacterium on culture, regardless of the extent of the pathological changes observed, seems to be ample proof that the microorganism usually finds its way to the kidney early in the course of the disease and is a primary factor as a cause of the nephritic changes that are found to be so characteristic of the disease.

Morphology and Staining

Bact. viscosum equi is a small oval bacillus 1.5 to 2 times as long as it is broad. The average length is 1.6 to 1.8 microns. Thread or coccus-like forms are seldom noticed in smear preparations. The organism stains easily with the ordinary anilin dyes, is Gram-negative and non-acid-fast. No capsules have

been demonstrated. The bacterium is non-motile and does not form spores.

Cultural Characteristics

The organism grows well on the ordinary culture media. A moderately abundant growth is present after incubation for 18 to 24 hours. Magnusson[3] characterizes the agar colonies of the bacterium as follows:

> On agar plates the colonies are very characteristic, being semi-solid and not easily separated. They are tough and ropy. When one tries to transfer them the whole colony comes along with the needle. They are grayish white in color. The submerged colonies are smaller than the surface ones. They are spherical and when slightly magnified ..... they show a darker central part, which is often stellate. The surface colonies are a little flattened but are, nevertheless, almost hemispherical. They are of a mucoid, glossy, gray color and under the microscope have a darker nucleus and a wide clear border zone.

While this description is correct, several facts may well be added. The viscosity of *Bact. viscosum equi* is not to be confused with that of the encapsulated bacilli of the *Bacterium mucosus* type. While the encapsulated *Bact. mucosus* type bacilli present an exceedingly moist, mucoid and rather spreading growth, *Bact. viscosum equi* presents a much dryer appearance. The colonies are actually tough and resist transfer, the loop sliding over the surface without picking up a visible amount of growth. On plates or slants where the colonies are well isolated and attain considerable size (1.3 to 5 mm. in diameter), the surface of the colonies become markedly changed. Instead of a smooth, glossy surface they appear dry and the surface of the colony is roughened. When examined under a hand lens they present a lobulated appearance, the small lobular projections occurring irregularly over the entire surface of the colony which is rounded and almost hemispherical.

We have noticed that when the bacterium is grown in an artificial medium for some length of time it tends to lose the viscous form of growth possessed when it is first isolated. The length of time elapsing after isolation before this change takes place varies with different strains of the bacterium. The viscosity of the growth of this organism is apparently not due to capsule formation. We have not, as yet, determined why this change takes place.

At times organisms have been recovered from young foals which were identical with *Bact. viscosum equi* except that they did not possess the viscous growth form generally possessed by this organism. Since the foals showed postmortem lesions char-

acteristic of *Bact. viscosum equi*, and the organisms recovered were identical with *Bact. viscosum equi* in every respect, they have been considered to be a typical strain of the bacterium.

One of the most marked peculiarities of the organism is exhibited when grown on the surface of agar slants. When growing on this medium the organism will not remain viable for more than eight to ten days, when held at room temperature. In gelatin or chopped-meat medium the organism will persist for three or four months without transfer. However, in carrying stock cultures on agar slants, it is necessary that they be transferred every six or seven days.

In gelatin at 20° C., a nailhead growth appears. In gelatin incubated at 37° C., very small colonies develop throughout the tube. No liquefaction occurs.

In bouillon the organism grows readily. A rather heavy, ropy sediment appears. There is usually a thin, filmy membrane at the surface. Small, gray flocculi appear along the sides of the tube and the whole mass appears more or less viscous.

The organism grows slowly in milk, producing acidity without coagulation. Slime is formed in all media which support growth. Indol is not formed. Hematoxins are not produced.

Dextrose, lactose, saccharose, maltose, raffinose, mannite and galactose are fermented. Arabinose, adonitol and dulcitol are not attacked.

Pathogenicity

Bact. viscosum equi is almost completely non-pathogenic for rabbits, guinea pigs and rats. When the organisms are administered in moderately large doses, no ill effects are noted. When extremely large doses are administered intraperitoneally or intravenously, death may result within twenty-four hours or the animal may be partially paralyzed. However, to produce these effects it is necessary to employ enormous doses and most workers have considered the organism as being non-pathogenic for laboratory animals.

The organism is highly virulent for young foals. Following subcutaneous injection of a living culture, the site of injection swells rapidly and an abscess is formed. The temperature rises, the foal becomes stiff and sore and lies down the greater part of the time. Septicemia develops and the colt usually dies in the third or fourth day following injection. Large numbers of the organism can be recovered from the internal organs and joints.

As the age of the colt increases, it apparently becomes more resistant to infection through injection of the organism. In yearlings, subcutaneous and intravenous injections of the organisms are followed by a severe local and systemic reaction and general arthritis. None of the yearlings used for experimental inoculation died during the six weeks and two months that they were kept under observation. When adult horses are injected subcutaneously, there is a severe reaction at the point of injection. The site of injection becomes swollen and inflamed and later an abscess forms. In the course of four to seven days, the abscess will rupture and discharge a thick, viscid, purulent fluid. The local reaction is accompanied by general depression and stiffness of the joints. After four to five days, the condition of the horse returns to normal, with the exception of the local reaction. The abscess heals slowly and the animal completely recovers.

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GRADING SMALL-ANIMAL HOSPITALS*

By J. V. LACROIX, *Evanston, Ill.*

During recent years I have had occasion to give thought to the hospitalization of small animals and to observe the result of my attempts at doing this work in a satisfactory manner. I have also noted the methods employed by many others, in different cities, both among veterinary practitioners with experience and those who were beginning the work. It has been interesting to the point of fascination, but the work of evolving a satisfactory plan for the functioning of an efficient staff and building and equipping a suitable hospital has cost much effort.

It has been my privilege to observe the methods of others, as stated, and as with other practitioners of experience, I have been made aware of the lamentable shortcomings that exist rather generally in hospitalizing small animals. This statement may be made without discrediting those who conduct hospital work and practice in an efficient and satisfactory manner. But, because of the lack of standards and because of no encouraging and restraining influence, there are today scores of establishments operating as hospitals for small animals that are a disgrace to our profession, a handicap, in some instances, to those who operate them and a bad influence on small-animal practice generally. In many places, veterinarians with no particular training for the work, without sufficient ambition or initiative to adopt that which has been proved meritorious in small-animal practice, have occupied store-rooms that are devoid of provisions for sanitation and lacking almost every convenience for doing creditable work, and with little else but a sign designating the place, "dog and cat hospital," the veterinarian responsible assumes the title, "canine specialist."

This obviously tends to discourage dog-owners from seeking efficient veterinary service where such is available and it is largely responsible for the classification of the small-animal hospital as a nuisance when, instead, the properly managed hospital for animals actually renders a civic and humane service to the community in which it is located. The small-animal hospital should be encouraged and not legislated against, as it has been, for example, at Miami, Florida.

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In this day, when the lay press of most every city in this country carries advertisements of nostrums for dogs, when almost every publication that is devoted to dogs is filled largely with these nostrum advertisements, and when store-window displays invite the public to purchase the numerous and sundry preparations that are guaranteed to cure the ills of the canine population, it is high time that we bestir ourselves to suppress this dissemination of misinformation and graft.

Not a few veterinarians, in their attempts to build really creditable hospitals for small animals, have expended large sums of money unwisely, because they had no knowledge of the physical requirements for the practical and profitable hospitalization of small animals on a large scale. The existence of available information on this subject, with means for supplying plans and specifications for different types of hospitals for those who would apply for this, would in itself be a boon to our work. Likewise, a standardization of small-animal hospitals throughout the country would be of immense practical value to all who are conscientiously rendering efficient service and attempting to carry out satisfactory hospitalization of small animals. Furthermore, it would encourage others to improve their methods, because of the contrasting position in which they would find themselves, reflected largely by the remarks made by animal-owners.

To start concerted action, the following is offered as an outline of a plan that seems feasible. The plan ought to be put into practice throughout the country as soon as possible if this body deems it advisable.

It is suggested for the consideration of the Section on Small-Animal Practice of the American Veterinary Medical Association that a committee of members of the Section on Small-Animal Practice be appointed for the purpose of formulating and recommending a plan in detail for presentation to the American Veterinary Medical Association, requesting this association to sponsor the work contemplated, herein outlined, so that the Section on Small-Animal Practice of the American Veterinary Medical Association might soon function along lines analogous to those of the American College of Surgeons, in their work of governing hospitals that meet with the requirements set forth in their manual for hospital standardization.

It is possible and I believe it would prove entirely practical to establish a minimum standard for small-animal hospitals,

grading them, for instance, in classes "A," "B" or "C," listing them all in a booklet, which booklet would be revised annually and supplied to all of the hospitals that qualify and become members of an organization that might be known as the "Hospital Branch of the American Veterinary Medical Association." The work of grading the hospitals could be done by an official of the state veterinary medical association in which the applicant would be located and this done in conformity with a manual for small-animal hospital standardization. A report of such an inspection would be made to the committee appointed by the Section on Small-Animal Practice of this association and this committee would pass on the report of the inspection, decide on all other matters pertaining to the grading of the applicant, and issue a certificate if the minimum requirements were met.

A membership fee of from $15.00 to $50.00 (the amount varying with the size of the hospital), payable annually, would defray all necessary expense involved in the entire work suggested herein. It would be the purpose to make this undertaking self-supporting and the American Veterinary Medical Association would be requested to lend only its indorsement and approval and its official sanction of the licenced hospitals as set forth in the certificates issued to qualifying hospitals. The certificates would be intended for hanging and display in a conspicuous place near the entrance of the hospital.

With this system in operation, practical and beneficial returns would result and they may be summarized as follows: (1) a higher standard of ethics would be encouraged; (2) more efficient service would result generally; (3) better hospitalization methods would be adopted; (4) definite progress would rapidly follow in the application of standardized diagnostic and therapeutic measures; (5) surgical technic would improve generally; (6) standard plans and specifications for small-animal hospitals suitable for different localities, latitudes and practice volumes could be supplied at nominal cost to all members who would apply for such help; (7) something analogous to "group medicine" as practiced by physicians would result in many places and profit the participants materially; (8) the use of the term "hospital" would be discouraged in its application to insanitary and mismanaged, "mushroom" establishments, thus encouraging the owners of animals to seek veterinary service when this is indicated, and not to employ the widely advertised nostrums that are now on sale almost everywhere; (9) members of the

"Hospital Branch of the American Veterinary Medical Association" would be supplied with a list of the membership and could refer clients who locate elsewhere, thus rendering a service to the dog-owner and to another hospital-owner at once; (10) the standardization of hospital buildings and management and the official supervision of member-hospitals would appeal to dog-owners generally and as the movement grew, quackery and the sale of nostrums in this field would abate; and (11) finally, wherever veterinarians seek loans to finance the building of hospitals for small animals, the banks and loaning companies would not remain skeptical, as they are at present, and the excuse that a hospital for small animals is a "special building," which might not be profitably managed in case of death or incapacitation of the one seeking such a loan, would not long obtain. Organization of the work and standardization of methods would tend to stabilize the enterprise and remove it from the class of hazardous and non-essential undertakings that ought not to be encouraged.

ACKNOWLEDGMENTS

Helpful suggestions from Dr. M. T. Macechern, Director of Hospital Activities of the American College of Surgeons, and reference to publications of this organization are hereby acknowledged with appreciation.

DISCUSSION

ACTING CHAIRMAN MILLER: You have heard this thoughtful and most valuable paper of Dr. Lacroix—thoughtful from all points of view. It is a thing that concerns every man in this room, and you should discuss this paper thoroughly. There have been many points given here from which you ought to be able to find something you can use. Personally, I think it is a very valuable paper and on the right lines, and it will increase the service of veterinarians generally and should be a great help to us. Discuss this paper thoroughly from the many points of view. It is too important to have the views of but one or two. You all must have views upon this question.

DR. J. C. FLYNN: You have listened to a paper that, at first, you might think is possibly a vision or a dream, an idea that would be very difficult to carry out, but the more it is thought of and the more it is discussed, the more valuable that paper will appear.

There is no ideal to which the veterinary profession should not strive to attain, and particularly is that true of the small-animal practitioners, who have the best opportunity to elevate the standards of the profession. It is a large question. We have many small animals, pets, and small animals that are not pets, that are used in a commercial way and that demand our service. It is only a matter of time, and that time is not far distant, when there will be, as the paper stated, many mushroom organizations springing up. Those little mushroom plants will not be a credit to the profession, and if the plan outlined by the essayist can be carried out, it will do a great deal to further the practitioner's work; that is, I mean the practitioner of high standing. A great many will attempt to imitate, and, from lack of ability and lack of funds, they will come into competition with the man of high standing and discredit his

work to quite an extent. Now, then, we know it is going to take time to work out a plan as suggested by the essayist, and it possibly would be a year at least before anything definitely could be done.

Dr. Lacroix spoke of legislation against small-animal hospitals in Miami, Florida. Possibly, there are not more than two or three people in this room who know what that legislation is. It is this: No dog may be housed within one thousand feet of a human habitation, which practically eliminates a dog inside of the city limits. Any individual could go down on a city dump and establish a little 2x4 place in which to sleep, and that would eliminate the building of a hospital within 1000 feet. Even down on the city dump of the city of Miami you can establish unjust legislation, and the standardization of hospitals would do a great deal to eliminate that prejudice against it.

This standardization of hospitals will not work a hardship on anyone. You notice by the paper that they would be classified as A, B and C. That means that the hospital of the man in the small town, where he did not have the large practice that men have in the large cities, would be classified in the C class, and he still would have a reputable hospital. When the time comes I will make a motion that a committee be appointed to look into this matter and present the whole subject to the Association in general session.

Dr. C. G. Rohrer: I believe this paper is going to do a great deal to benefit the small-animal practitioners, but I believe also that it can go one step farther to help along the hospital work, and that is to have our students get a little more hospital experience before they are turned out. We have in New York a number of small-animal hospitals conducted by veterinarians who have never spent a day in any hospital, who were graduated from school and opened up a small-animal hospital, with absolutely no knowledge of hospital work. It is an entirely different thing to run a hospital for small animals, from going out and doing a general practice, and I believe that if the students were encouraged to spend some time in a small-animal hospital, after graduation, it would do a great deal of good for the small-animal practitioners. I believe the idea is very good and should be carried out, and it could be carried out very successfully, but it is going to take a little time, I think.

Dr. Joseph De Vita: I think this would be a very dangerous experiment, because, although the human hospital is not privately owned and can be easily graded, ours are all privately owned and it will tend to stimulate the popularity of institutionally-owned hospitals, taking the practice away from the individual, which happens in most of our large cities. I think if we look into it carefully we can see a lot of danger to the profession in the future. I believe all specialists should be consultants and surgeons, and, if anything, should discourage the housing of sick animals, because their psychology is such that they cannot be housed in cages when ill. You cannot put a well animal in a cage and keep it well. If we discourage that idea we will do more to elevate our profession and not hurt it. I have proven that in my place. We do not sell dog foods or worm remedies, or anything of that nautre. It is just a consulting office, the same as a physician's office, and I believe that is one of the ways by which we can raise our standards.

Dr. F. E. McClelland: I do not agree with the gentleman. The hospitals for humans are so much ahead of veterinary hospitals that there is no comparison, and I think the reason for that is the fact that they are institutionally owned. I was on the point of asking Dr. Lacroix whether he considered the centralization, so to speak, of veterinary hospitals in large cities being used by the practitioner, the same as other hospitals for human beings. They could be more concentrated and have better equipment and better care could be taken of the patients.

So far as the young man starting out in practice is concerned, my experience has been that he is better off without the hospital. If he has a good place to take his patients for surgery, or anything else, and just have his own private practice without the hospital, I believe he would be better off.

Dr. Lacroix: In reply to the statement made awhile ago concerning danger, I cannot admit that I see any. First, because it does not put the larger practice at an advantage, nor the smaller practice at a disadvantage. We speak of grading hospitals. The certificate issued would not show the classification any more than it does today in the hospital for human beings.

It would simply show that it is a member of this organization, and there is the certificate. There is nothing about it compulsory, or nothing about it encroaching upon the corporation or laity in any way that I know of. I would like to have a specific hint as to how it would do that.

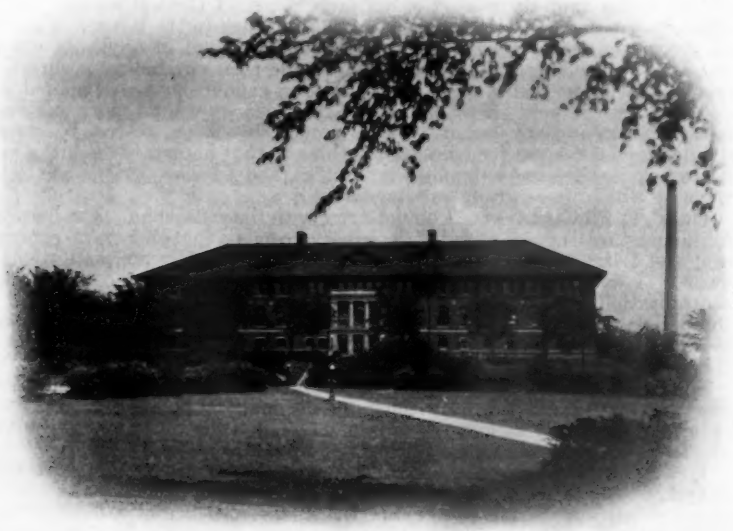
DR. DE VITA: I was connected with a public hospital for a short time, and I can see how that would work out. No individual can compete with an organization with a lot of money behind it. The psychology of the dog does not lend itself to housing when sick. Speaking about personal experience, I have seen what public institutions will do and what private practice will do, having been a part of such an institution, and I do not believe that backing any such plan would help the profession. I believe that the specialist in veterinary medicine should be like that in ordinary medicine. Very few physicians maintain hospitals. I believe the hospital in veterinary medicine, if the field requires it, should not be individually owned, but one which all should use. Let the specialist be consulted and the surgeons, but not the conductor of a hospital. I believe it is the only way in which a hospital would benefit the profession and raise the standard.

DR. LACROIX: I would say that you are passing the buck in this way. You no doubt give good service, but it is an incomplete service. There are too many cases that cannot be kept in the home.

DR. DE VITA: I can speak of cases of severe operations, of the stomach and the intestinal tract, where they were at home four hours after the operation, and one can always provide homes which will give individual attention twenty-four hours in the day, if they require it, for a few days. No pet will do as well in a cage; it is against the psychology of the animal.

DR. LACROIX: We all know that hospitals are necessary. There are cases that can be treated only in such institutions. It is a matter of opinion. Replying to the second objection raised, I would say there is nothing to prevent the veterinarian from practicing group medicine. In our hospital, where there is surgical hospitalization also, we handle the bad cases, and it is very satisfactory. We send many of them home, using our best judgment.

Minneapolis, the Breadbasket of the World



The Administration Building at University Farm.

DOES SPECIALIZING PAY?*

By FRANK H. MILLER, *New York, N. Y.*

I feel myself deeply honored in being allowed the privilege of addressing you today upon the important subject of specialism, as it does at the present, and may in the future, bear upon the progress of the science of comparative medicine.

At the outset I would draw your attention to the fact that this, my contribution, will in nowise differ widely from the general rule that such papers are usually of the controversial character, and being such it is always well for one to approach his subject with the full understanding that opinions cannot in the least alter the facts.

Therefore, as I see it, it is fitting and proper to give that as my reason for bringing the subject before you, as I do, in the form of an interrogation, that perchance our exchange of opinions here today, and due reflections when we are widely separated, may bring home to each one of us a clearer and higher understanding of the words "specialism" and "pay."

Some years ago, when a goodly number of the progressive members of this association felt that the rapidly growing demand for more and better veterinary service in the care and treatment of luxus animals was not receiving the time and opportunity it required at these meetings, owing to the ever greater press of proceedings incidental to doing proper justice to the clearly paramount consideration of the subject of agricultural veterinary medicine, this association set apart this section, an act for which we are both proud and deeply grateful.

It was not instituted, as I am assured, with the thought or feeling that it was to be, or ever become, the privileged playground of those alone of this profession who, choosing to throw off the decidedly greater responsibilities which will always attend the vastly more important life of the general practitioner, but to be, as it were, a practical clearing-house for the profession as a whole.

If this departure was, as I firmly believe it to have been, the results of sound motives, it certainly must have been with the purpose, hope and expectation that it would primarily further the interests in, and broaden and enrich the whole scope of,

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general veterinary science and, secondarily, that it might be of greater and greater advantage, as time goes along, to those of us who elect to do special work among smaller animals.

Personally I am convinced that true specialism, properly and ethically carried out, does pay the highest dividend possible in any profession and is of the greatest possible service, when so conducted, in adding to the sum total of human knowledge. What accomplishes that needs no apology from anyone. Doing this, it cannot fail to yield inestimable values, both social and financial, to those who honorably and ethically practice in this profession, regardless of whether it be along lines of general or special effort.

There exists in the minds of too many veterinarians today, and this possibly applies more particularly to the men of recent graduation, that specialism in this, our particular profession, is of very recent development, but kindly let me point out to them, and that clearly, that upon the whole the great majority of those who are within this room today are the living examples and the products of modern specialism which has been going on for many years.

Specialism Began Among the Teachers

No, gentlemen, specialism in this profession may truthfully be said to have found its birth in the death of the old system of private veterinary educational institutions in this country and the inauguration of state education. It did not begin with the practitioner, as some think; it began among the teachers and has been taken up by the practitioners.

There was little demand and indeed less opportunity for the specialist in what some of us are still pleased to call "the good old days," when we followed and idolized the faithful old practitioner-teacher in our college and measured his worth and ability by the number of different chairs of teaching he was able to supply, frequently one, two or three, and sometimes four in number. It was the needs of specialism in the qualifications of teachers which made the change of systems needful and indeed possible.

It is true it was not then, nor for that matter is it now, much spoken of as specialism as applied to the teacher, but of a certainty it has been and will remain that in virtue and effect for all time.

Public recognition of the immense importance of veterinary science to the upbuilding and safe maintenance of sound, general agriculture, was calling for veterinarians of greater professional attainments, men much more intensely schooled in the science of disease and the various states set out to attain them in the only possible way, *i. e.*, by selecting their own teachers and lengthening the period of study.

The teachers under the now prevailing system were not appointed in any haphazard manner or because they were prominent or influential veterinarians, but men were righteously sought after and obtained, who were preeminently fitted to impart to students knowledge in certain specific subjects only. They were not, nor were they to be, what in the parlance of the hour are known as "all-around men," but specialists of a high class, to be maintained and paid to bring the greatest possible excellence of teaching into the narrowness of their various subjects.

No veterinary institution in this land would today think of calling to a professional chair in any of the basic subjects of our profession a person who could be looked upon as falling anything short of the standards of a specialist in his line of teaching. There, gentlemen, is where specialism at its best put in its appearance in our profession, and who can doubt as to whether or not it has paid.

A Tribute to the Teachers

We are not now thinking or speaking in terms of the coin of the realm but in terms of progress, hoping to come to the coin a little later. We all need ideals and by speaking thus of our veterinary teachers I am honest in my effort to hold them up before you as an ideal not only of the original specialist in this profession, but in addition pay humble and sincere homage to the men who, by their standards, are rapidly bringing this profession into its present standing of good report and great service throughout this country and the world, men, who first fittingly and adequately qualify themselves for the work and life before them as specialists, men who knew their subject and would scorn the principle of the dabster.

As in the other branches of science, comparative medicine is daily—I might well say hourly—being confronted with such overwhelming numbers of unsolved questions regarding the appearance of new diseases, and the still-hidden phases of many

of those already recognized, all calling for solution, as we scarce can visualize, much less successfully cope with, unless greater and greater numbers of our most able graduates will turn to specialism in the broad field of investigational work. Those men, to be of signal value, must be intensely trained and experienced along very special lines and persistently and consistently follow those lines. They must be, whether or not they so acclaim themselves, true specialists and not of the pseudo-specialist type, for, from such, science has usually expected little and received less.

Where, for instance, would be the hope today for the poultry- and stock-breeding industries of this country, were it not for the things already accomplished in their fields of actual research by those specialists and the abiding faith in what they will yet accomplish in solving their problems, the task which will ultimately snatch success from impending failure?

Millions upon millions of dollars of natural wealth are annually being saved by such men from the spade treatment of our earlier days. All honor to those men, certainly the very flower of our profession, men who are today unquestionably doing the lion's share in the general advancement of our science and who are, we must regretfully and somewhat shamefully acknowledge, receiving the fox's share of financial reward for their loyal devotion to a mighty cause.

Webster's Definition of a Specialist

Webster has defined a specialist as "a person who devotes himself to some one line of study, occupation or profession." Now it is most decidedly *not* the function of our veterinary colleges to graduate ready-made specialists in *any* branch of comparative medicine. They have been chartered, and are being properly conducted, to furnish to each and every enrolled undergraduate an equal opportunity to obtain a well-balanced education which will properly and adequately fit him to take his place in the ranks of the general veterinarians.

It is well for *all* to remember that there is no degree of veterinary specialist awarded in any college, no, not even in the form of an honorary degree. Speaking to the point, the term of specialist is as a crown that individuals place upon their own heads. The enjoyment of such crowns, as we know from history, greatly depends on how they are attained. If come by, by fair and honorable means, they may prove to be very comfortable

and profitable ornaments. If, upon the other hand, they are reached by unscrupulous methods, as by the betrayal or studied injury of honorable coworkers in the profession, uneasy must lie the heads that wear such crowns if those men be not absolutely devoid of moral sensibility.

Since I have taken the most important part of my text from Webster, I have no choice whatsoever but to account a person as a specialist in this profession, or any other for that matter, as only he who follows some certain line of his profession and that means devoting his entire effort to his specialty and demanding financial remuneration only for such services as may come within the scope of that which he acclaims as his specialty.

No graduated veterinarian, legally qualified to practice his profession, should, it seems to me, be held up to the particular scorn of either the profession or the public, who assumes for himself the standing of the specialist provided, however, he confines himself strictly to his specialty and as strictly refuses financial considerations for going outside of that, his chosen field.

I wish not to be understood as wanting to convey the impression that I think it advisable, especially for the recent graduate, to wish immediately to classify himself as a specialist in any particular branch of the profession without first having, in some way, by very special preparations, familiarized himself by actual and ample experience in the work about to be taken up.

Theory and Pratice

There is a vast difference between the ability to write a good college thesis upon a subject, and that which is required in making one's mark as a true specialist in any line. There is a passage in the good old book which is worth remembering which runs thus: "Not everyone who sayeth Lord, Lord, shall enter the Kingdom."

He who takes up a specialty should thoroughly weigh his responsibilities to the public, and the very important fact that since he has willed to focus his life work to a field much less important, and much narrower than that of the general practitioner, the public is perfectly justified in expecting him to reflect a more extensive knowledge and experience in his particular sphere than obtains in the general practitioner, and he who is illy prepared for his undertaking will often times find his crown of specialist is upon his head askew, and liable to be

knocked off in public by the well-informed and skilful general practitioner who makes no pretension whatsoever of special knowledge.

A thing that is worth doing at all is worth doing well. We need specialists in our line and they can be of inestimable value, both to the public and to the upbuilding of our knowledge of animals and their diseases, but if the world or this science is to reap the benefits which intensive specializing in veterinary science can and is supposed to yield, this profession must early come to firm conclusion as to the kind and quality of specialists it stands ready to recognize and, incidentally, to support loyally. Specialism capable of rendering values to comparative medicine has a task before it much greater than simply serving the public at a price.

The real price to be paid by the specialist is first his *unquestionable* loyalty to the profession which has to vouch for him, and secondly to gain such skill in his calling as, along with proper ethical treatment of his brother veterinarians, will command for himself not alone their respect but what is absolutely necessary, their hearty support, and he who goes into specialty and allows himself to become more or less alienated from the profession to become a sort of veterinary pirate, usually, I may say constantly, proves to be a very heavy liability instead of an asset to the profession.

Specialism Must Win Support

Specialism in veterinary fields of service, to gain a position at all comparable to that held by specialism in the sister profession of human medicine must, by the manner of its conduction, unquestionably show that it has won the support of this profession as a whole.

The day has not as yet arrived when the veterinary specialist can depend almost exclusively upon the good will of the general practitioner to furnish him with clients, as is true in the sister profession, nor will such a time rapidly come to pass if the so-called specialist uses one hand to pick up practice under the guise of a specialist and the other to burrow into the very vitals of the general practitioner who still is, and always will remain, the bulwark of this profession and who may be quite as well equipped in every detail as, even possibly better than, the pseudo-specialist.

The earlier this association takes cognizance of this great evil and applies suitable remedies to combat it, the earlier will true specialism come into its own and the greater benefits it will bring to all. Professions, just as truly as states, require protection, and it would seem but common justice that our code of ethics should be of sufficient strength to reach and draw a very effective fence about the man who persists in boring from the inside.

I have taken the modern teacher as my ideal of the specialist and commended him to you as such, in our effort to advance specialism, but as a matter of purely constructive and kindly criticism I would suggest that in his capacity he, the teacher, could render the profession a very great service in waving our veterinary undergraduates *to*, or *from*, specialism as might be to the best interests of the man and the profession, by reason of his close contact with them throughout their studium.

The student's age is usually a most impressionable one and who could possibly be more competent to discover in him the various qualities which should combine to make for the best final results, both for the man and the profession, than the teacher who has himself accomplished a specialty and to a very great extent has aided in moulding the character and educational bent of the young men destined to constitute this profession?

Adaptability Should be Considered

The professors of our schools certainly know where men are most needed, both for the public welfare and for the building up of the science, and it is to me quite thinkable that a more careful consideration of the adaptability of individual undergraduates to certain spheres of usefulness might work incalculable good in helping them to find their proper niche, so to speak, if they could draw more freely upon their instructors' advice when shaping their life's work.

The place where the professional man can give the greatest service to the greatest numbers will always be found to be the most remunerative from all points of view, and it should, I think, be clearly pointed out to him during his college career that the various fields of specialism are in many ways limited, whereas that of general medicine and surgery scarcely has a limitation. If this simple but important matter were to receive serious attention in our colleges, I feel it would have a great

tendency to lessen the number of misfits and minimize the veritable "gold rush" which is now in evidence, especially in the small-animal field of veterinary medicine, and save a greater number of men for the field of general medicine, where they are greatly needed at this hour. Rushing into specialism, like rushing to the gold field, will in the end be settled in the old, old way, of survival of the fittest.

It is undeniably in the interest of public health and safety, that the number of the smaller, purely luxus animals in the country be more and more strictly limited, while every law is invoked to increase the number and throw safeguards as rapidly as possible about the health of all of our agricultural animals in the interest of public welfare, and if the present great tendency for our young men to turn from general practice to that of specialty continues (especially in this our particular line), I fear that within the next decade there will be a great many veterinarians "all dressed up with no place to go," as the saying goes, men who, indeed, had they properly weighed the situation, would have been permanently settled and firmly rooted in the esteem of general agricultural communities, prosperous and independent men, filling the greatest possible needs of the country at large, and for which the state really supports the veterinary schools which educated them.

Investigators Badly Needed

In giving our due and thoughful encouragement to proper specializing as an uplifting force in this science, it behooves us properly to inform ourselves as to where specialists are most needed, as well as the numbers needed and, most important of all, the *quality* of the men who are to specialize. Personally I am convinced that by far our greatest need for specialists today lies, not in the field of applied medicine and surgery, but in that of investigational work.

There are two great reasons why such specialism needs our careful and most sympathetic consideration in inducing young men of ability to take it up. First of all, investigational work calls for exceptionally brilliant, careful men of enduring patience and perseverance. Secondly, such work is practically all carried out at the expense of the state, and the financial rewards are usually so painfully inadequate, considering the quality of the men and the value of their work, as to prove an almost insur-

mountable barrier in recruiting those men from among the most promising in our profession, as should be the case.

I have already touched upon the value of specializing as it applies to teaching the science, but in point of importance the scientific investigator must, at least I think he should, rank ahead of the teacher as a specialist since the things which we cannot at present fathom are our real hindrances to progress, and for the most part the teacher, as well as we practitioners, must wait, patiently or impatiently, until the investigator clears the path for us. The teacher can impart only the knowledge that has become available and there is much work ahead for the investigator.

Here, gentlemen, some, I may say *much*, of our encouragement must be in terms of the coin of the realm. The only way which appears open to us ultimately to get the results in this direction, which this country and the profession greatly needs, must come, it would seem to me, as a result of the united efforts of the profession to bear in upon the minds of legislators the utter hopelessness of obtaining and retaining the life service of the kind of men their interests urgently demand, unless they provide financial support of such character as will at least make life tolerably safe for them and their dependents, a state which certainly does not exist at the present time.

Let us seek support for these two already recognized specialties, that of the investigator and the teacher, and as a matter of course the other needed fields of specialism will, if conducted along proper lines, be developed along the common law of supply and demand, but it will be well, exceedingly well, for those about to enter such fields of specialism not only to study their adaptability but also the demand, as a profession over-specializing would be as undesirable as over-capitalization is in industrial life.

Discussion

Dr. H. J. Milks: We all know that too many young men are going into small-animal work and I think the fault lies largely with ourselves. If a boy wants to work for someone during vacation, there is almost absolutely no place for him to go except into a small-animal practice. I try to tell my students that there are opportunities in general practice but when they come up to the vacation of their junior year and wish to get experience, the only place they can get it is with the small-animal practitioner. Naturally, after that experience, their whole ambition centers around that kind of work. They cannot be blamed for it. You and I would react in the same way.

I believe that some of our men in general practice should take hold of a portion of these men and set them right. It seems to me that there are as great opportunities for the average man in general as in small practice. It is generally conceded that the profession and this association need the general

practitioner, but until the students have more opportunity to become familiar with general practice, they are going to believe that the only place for them is in work with the small animals.

DR. J. ELLIOTT Crawford: I want to thank Dr. Miller for his very able and well-written paper. I thoroughly believe that Dr. Miller has covered the situation in a nutshell. Take the young men who have gone out from Cornell this year, both the graduating class and the junior class, and you will find that probably three-fourths of these men are practicing around with the canine men. Now, after these men practice around with the canine men and get a dose of canine medicine, what do you expect tham to do when they start in practicing themselves? Young men are going out from the junior year, and after graduation they will look for positions, and the only positions open to them, outside of government positions, are with the small-animal men, and they go into these places and get used to working with dogs in hospitals. It is a remunerative practice, and naturally they soon start off for themselves.

DR. MILLER: I would like to say just a few words regarding one of the viewpoints I have taken in this paper. I am opposed to the specialist delegating his work to young and inexperienced men. This is a personal opinion and probably will not much change the present trend, but it strikes me forcibly that one of the weakest points in our profession today, is the great tendency of our members, when they are getting more business than they can personally handle, to add other men to do their work. What is this for? Simply to put more upon their books as is common in the most ordinary trades. If you are really a specialist do as real specialists do in the sister profession—cut down the number of your clients and advance the price of your service and let those who prefer not to meet your demands gravitate to another practitioner who may be in much need of this very work to help himself honorably along in your same field. Give the other fellow a chance to live upon his own merits. That is what he prepared himself for.

I cannot conceive of anything calculated to be more helpful to a profession than to have specialists attending more strictly to their specialties, creating honest reputations for their ability and authority, having it recognized by the profession and public, and who sell their services at special prices, but who avoid selling the services of others to clients as if his own. This makes a mark to which all high-grade men wish to aspire, and that cannot fail to be a general uplifting influence in the profession. We are all most anxious to see more men go into veterinary medicine but we should be equally anxious to see that they have a fair field and no favors when it comes to making a living after graduation.

Hogging practice is neither genteel nor is it honest in a profession. Do what you can with your own hands and willingly pass the rest along to the younger man who will some day rightly take your place of honor and good will and be your constant friend. It is an undeniable fact that every one of our veterinary schools is today maintained for the purpose of educating men to assist in conserving the health of the agricultural animal and I for one am entirely against the policy of leading too many of our young men away from general practice, where their services are so greatly needed at this moment.

Many of our veterinary students need mature advice when deciding upon their postgraduate careers. Not all are fitted for specialism in the small-animal field. Some become misfits and find it out only when too late, whereas if they had gone ahead under good advice in general practice, with the same will to succeed, they would not only serve a much higher purpose but be much more secure financially.

To make a true specialty of pet animals requires a great dog population which can prevail only in comparatively large centers. It cannot be accomplished in any small suburban town. At best there is not more than one dog to each three families, and with this one animal enjoying health conditions usually more stable than that of the owner, one can easily see that it takes a large city to serve as a field for the small-animal specialists. Through the practitioner of general medicine all the domestic animals of the countryside are his for care and treatment, and this of neceessity involves practically all the dogs outside the larger cities.

Reason greater than this lies in the fact that the great industry of agriculture needs and is willing to pay, and pay adequately, for good veterinary service and it should not be forgotten there is also room there for a great deal of specialism. I am not dealing sour grapes, gentlemen, in this matter, and this pleasantly reminds me of having visited a vaudeville performance given by "old-timers" where a very venerable and ruddy-faced gentleman, whom I took to be a clergyman, wearing a Prince Albert coat and white tie proceeded to expatiate at length upon the iniquity of the saloon (this was just before the 18th amendment came upon us), saying there were now practically three saloons upon our avenues at each street-crossing, an intolerable and disgraceful condition, which should be remedied at any cost. Then waiting for the applause of the "drys" to die down, he brought down the house by exclaiming, "I've had mine."

No, gentlemen, it is not sour grapes. I have seen the first of the small-animal specialty and am pretty well through. It is true I have had all that was rightfully mine, and can calmly look to the future and see there, every evidence of overcrowding in this specialty field and an increasing dearth of highly qualified veterinarians to serve the ever-increasing needs of pure agriculture.

The success in specialism in the realm of small animals is daily becoming more and more speculative, while the more needful and less hazardous, but equally remunerative field of general practice is unquestionably suffering from the misplaced efforts of two many of our graduates.

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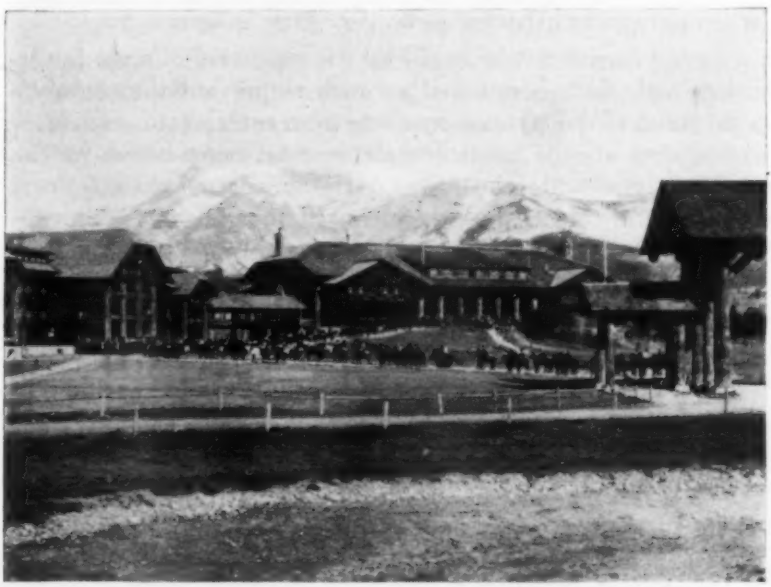

Glacier Park Hotel, Glacier National Park.

THE SMALL-ANIMAL DIETITIAN*

By FRANK E. MCCLELLAND, *Buffalo, N. Y.*

The reasons for presenting this subject for discussion are three-fold:

First, the embarrassment caused by the apparent contradictory advice given a client by each of several veterinarians, especially in the same locality. It oftens requires all the tact we can muster to explain this difference of opinion, if we desire to remain strictly ethical, because, of course, no one of us wishes to appear ignorant of so important a subject, and the ability to give correct advice is so apparently a duty belonging to our profession.

Second, the education of the animal-owner in the dietetic and hygienic care of his pet. This consists principally of teaching the common-sense obervance of nature's laws and the most difficult task of all is persuading him that about two-thirds of what he has been told is pure superstition or is based on some ancient, obsolete form.

Third, the invaluable importance of the proper and correct knowledge which we as practitioners should have of this subject in the handling of our patients in health, disease and treatment. In comparison to other subjects, very little is known.

I hope you will not be bored by the repetition of some apparently simple facts because, if we wish to prevent the confusion in the mind of the layman, resulting from contradictory scientific advice, they are the fundamentals we must know before we can intelligently educate the owner. If the normal physiology of digestion and of the alimentary canal is not known or thought about, there is no true basis on which to work.

How easy it is for most of us to "follow the crowd," even after years of professional training, and let the old theories, based on mysteries, guide our actions. Those of us who were graduated before 1912 must read the newer text-books to know that most of the knowledge concerning digestion is definite fact and not theory. Of course, those who left college since that time have no excuse for not knowing. Also, we must not forget the teaching of experience.

*Presented at the sixty-fourth annual meeting of the American Veterinary Medical Association, Philadelphia, Pa., September 13-16, 1927.

Time will permit only the discussion of the carnivora, with an occasional remark regarding the comparative differentiation in the herbivora and omnivora.

Since the carnivora tear and quickly swallow their food with very little mastication, practically no salivary digestion takes place. Therefore, the starch conversion which is very noticeable in other animals is nearly negative. There is no true starch-digesting ferment in the digestive tract of carnivora. Only the pig has a true enzyme of this nature. The very slight action of the saliva and the increase of activity of the gastric juice takes place only when water is added. This explodes the theory that normal puppies and dogs should not be given plenty of drinking-water. The almost entire absence of starch digestion forces us to conclude that such foods as potatoes, rice, macaroni, corn meal, bread and other uncooked or raw cereals should be mostly eliminated from the diet. Also, as a matter of fact, starch digestion can not take place in the presence of free hydrochloric acid. This is of great importance as will be seen later.

Gastric Juice Strongly Acid

One-half hour after the food is swallowed, the normal secretion and activity of the gastric juice has become very pronounced. Its reaction is strongly acid, due to the presence of free hydrochloric acid, the amount of which is about four times as much as in man or other omnivorous or herbivorous animals. Nature provided this in all carnivora, apparently to act as an antiseptic in the gastro-intestinal tract and to digest meat. Another content of the gastric juice is the calcium salts. These unite with the rennin to digest the casein of the milk, which in puppies is well provided, but in the adult this process is almost prohibited, due to the presence of the excessive acid. Therefore, the use of lime water during puppyhood and always in the milk diet of the adult is almost a necessity. If the layman could be educated to use lime water in the dish of drinking-water, instead of sulphur, and also that the addition of salt to the food or water would help create and aid the action of the gastric juice, what a blessing it would be to the dog. The gastric juice of the adult carnivore has the weakest action on milk of any food (Smith). Raw flesh, especially beef and liver, is the most easily and completely digested of any food. However, it should be remembered that it requires about twelve hours to digest the amount of meat ordinarily consumed at one meal. This knowledge guides us in the

advice as to the number of meals per day of the meat-eating animal. Experience coincides with this fact that one meat meal in twenty-four hours is sufficient, except in young pups, where small amounts are consumed, or in certain pathological cases.

Of equal importance is the disposition and absorption of the food. Practically very little food and no water is absorbed from the stomach. It slowly empties into the intestine, where, after further transformation by the intestinal and liver ferments, it is taken up by the lymphatics. The reaction of the intestinal content becomes less acid and therefore less antiseptic as it travels away from the stomach. This may explain why infection is so much more severe in the posterior part of the small and in the large intestine, and why artificial insertion of saline and antiseptic solutions are of such great benefit in treatment of these conditions.

With all of these facts in mind, let us apply them in selecting diets for different ages and different normal conditions. It is unnecessary to say that the less we try to improve nature the better success we will have. However, it often becomes our duty to advise feeding of the very young before the nursing period is past. Up to the age of three or four weeks, a constant diet of the following formula has been found very satisfactory:

Sweetened condensed milk.....1 part
Lime water .....1 part
Boiled water.....4 parts

The fact that the bitch's milk is approximately three times stronger in proteins, fats and salts than cow's milk, urges us to strengthen these elements in the diet of the young at the earliest possible moment.

After four weeks, the addition of baked cereals and a little meat is in order, the latter being increased gradually, the milk lessened gradually. The growing pup should at first be fed about four or five times a day, until the fourth month; then two or three times a day, until seven or eight months old, and then put on an adult ration which consists of one meal a day. A light meal of biscuit in the morning and a heavy meat meal at night seems to be the easiest and best advice for the grown animal. It may be well to mention the use of tripe, raw or rare-cooked, mixed with dry bread, as a good variation diet for patients with gastric disturbances and for growing pups. Of course, a variation in the kind of meat and the addition of ground dog biscuit

and some vegetable, such as carrot and green stuff, balances the ration. Working dogs should be fed much larger quantities, but the principle is the same.

Let us now consider the application of these diets and their variations as an aid in the treatment of disease. I have observed that the average practitioner does not realize the importance of control of diet in every case brought to him. A very frequent patient is the nursing bitch. My experience has persuaded me to disagree somewhat with some eminent authorities, both professional and lay, as to the diet of this class. Granting the almost irresistible tendency to feed the nursing mother great quantities and often, of soft food and milk, I have seen only trouble from this practice, eventually, except perhaps for the first two or three days. On the other hand, on the principle outlined above, the dry food and meat diet, increased in amount, of course, will keep the milk supply up in quantity and of much better quality than in any other way.

The unfortunate victim of pernicious appetite and chronic gastric catarrh, or vomiting, deserves a carefully studied-out diet. Generally this is the result of a gastric irritation from an improperly ingested substance or more usually from an unbalanced ration. Lime water in a restricted drinking-water supply and rather frequent and small quantities of raw tripe and meat meals, eliminating all starch and milk, should be the first advice. Also insist on complete relaxation and rest for at least two hours after the meal.

The Diet in Febrile Deseases

In febrile diseases, where the circulation is disturbed, the mucous membrane of the stomach and intestines is rendered unable to function. In such cases if we can only persuade the owner to be guided by the instincts of the animal! Loss of appetite in most cases should be a source of worry to the owner and not to the practitioner. Forced feeding is extremely unsuccessful and unsatisfactory. The first food taken, regardless of the almost universal tradition and belief, should be scraped beef and occasionally lean-beef tea, made from unseasoned extract. The exception here may be a partial diet of cooked eggs and milk in the form of custard. Fresh warm beef-blood, if available, has been of great value in these cases. Milk only produces a load of indigestible casein, and other foods leave a residue and resulting work for the weakened organs, which is undesirable.

The next group of diseases I would like to discuss includes those gastro-intestinal infections such as distemper and typhus, or infectious gastro-enteritis. While we are satisfied that the intestinal infection of distemper is secondary, that of typhus is a very virulent, fatal infection predisposed by any debilitating circumstance, such as continual confinement in a kennel, nerve shock, chilling and exhaustion or irritant food or ingesta, such as over-dosing with castor oil or worm medicine. Dietary treatment should begin with small and often-repeated amounts of drinking-water, to which has been added lime water or barley gruel. We have found that two meals daily, of restricted portions of raw or rare-cooked ground beef, to which has been added raw wheat bran in as great a quantity as the animal will take, will produce the most gratifying results. In fact, if I was limited to any one cereal, it would be bran. A mixture of bran or alfalfa meal and charcoal is beneficial in many cases.

Malnutrition and Rickets

The last group of diseases, depending so entirely on dietary circumstances that they must be mentioned, includes malnutrition and, closely allied to it, rickets. Nothing we treat will respond in a general way so quickly to a proper change of diet as these diseases. A program eliminating milk and starch and supplying fresh meats, especially beef and liver, will work a miracle. There are occasional cases—I have seen it only in Russian wolfhounds—where the distortion of the joints was accompanied by great pain and apparently a form of mental or nervous suffering and crying. These are more stubborn and annoying. However, sunshine, a meat diet and cod-liver oil seem to bring relief.

Summary

In a paragraph of general remarks, I would sum up as follows: Except in occasional cases, where one good dose of castor oil will quickly remove inert masses from the alimentary tract, it is altogether too irritant to the digestive membrane of the stomach and small intestine. Next, teach the owner not only not to give repeated doses of castor oil, but not to give worm medicine to cure every disease except worms; that, after the nursing age, milk is the least important and hardest of any food to digest. Last and most important of all, insist that the basis of diet, almost from the time the puppy can chew solids until he dies of old age,

should be meat, liver, fish, tripe, etc., fed once in twenty-four hours, with complete rest for two hours after the meal.

Discussion

Dr. F. H. Miller: I wish, first, to compliment Dr. McClelland upon his extremely good paper. I tried to cover this subject at Cornell a few months ago, but I believe he has made the point I failed to turn.

There is one feature of his paper to which I wish especially to call your attention. He makes mention of the inability of the dog to digest starch in the stomach. This I consider the salient good point in his paper. We are supposed to be missionaries in the field, teaching people how properly to care for animals, perhaps more than to treat them, and we are up against the silly old fallacy that dogs should be kept upon a minimum amount of meat, many indeed advocating that they should have none at all. We come across such persons almost daily in our practice.

Now it is a demonstrable fact, as Dr. McClelland contends, that food mixed with saliva in the stomach of the dog will not convert starch to any extent at all. Carbohydrate digestion is practically nil in the dog's mouth and stomach.

So far as digestion in the dog is concerned, I think this a most important thing to remember. This question of meat-feeding is a thing that must be carefully approached, since our clients, while entirely and hopelessly wrong, think they know all about it, and it is very difficult at times to correct their reasoning.

Another thing that is at times difficult to convince our clients of, is that the dog which has been kept upon a liberal meat diet usually stands up better under disease than the one that has been supported upon starches. The starch-fed animal certainly does not have the stamina. This is particularly true in the face of distemper, where the mortality among the starch-fed animals runs far, far above those receiving plenty of meat. If we can only get these facts over to the people, along with what Dr. McClelland so clearly points out to us today relative to gastric disturbances, it will do much to save dogs and convince people.

I do not know that I quite gather Dr. McClelland's meaning in one respect. Possibly I may have misunderstood him regarding his disposition to reduce the consumption of milk by the dog. It would be interesting to hear more fully his reasons for this.

If the dog digests milk well, it has the advantage that it is usually pure and easily obtained, which is not always the case regarding meats. Especially is this true in traveling. Not only is it pure but, with the exception of eggs, it has the reputation of being the only single article of food capable of giving perfect growth and vigor in dogs from birth to old age.

I cannot see any real solid reason for discarding milk from the dog's diet, either in health or disease, provided he relishes it and digests it properly. It stands to reason that it should not be given if it disagrees with him, and I freely admit that there are cases, as in ourselves, where it is poorly digested.

I would like to say a few words, also, relative to the use of meat in the very early stages of the dog's life. Its general value as a diet for all dogs is, to my mind, pretty strongly borne out by practical experience in the rearing of the smaller and more tender breeds of dogs, as for instance in the "Charlies." The more successful breeders of those small dogs wean them at a remarkably early period and bring them forward by the free use of scraped raw beef.

This practice at first seemed to me most irrational, but the general results obtained by the breeders soon convinced me that my position was a theoretical one which I had to abandon. They raised more puppies by this system than by the use of the older method of baby-milk-foods so commonly in use. If the puppies' stomach can take care of meat at such ages, it clearly indicates that in general terms it is the food for all times for this animal.

Dr. McClelland: In regard to the milk diet, we all know that a certain number of dogs will adjust themselves to a milk diet. I do not know how to explain that except that nature provides a good supply of rennin and calcium

salts that will digest the milk. Scientfically, milk is the least easily digested of any food. The milk is changed into casein, which is almost indigestible. The only digestion that takes place is when the calcium salts combine with the rennin in the stomach. We find the majority of grown dogs do not do well on milk. Dr. Miller spoke of eggs. We advise eggs a great many times, but I have seen a considerable number of dogs that could not digest eggs. I do not know why that is, but it is a fact.

Reducing the milk diet is, in a general way, from a practical point of view and from a scientific point of view, the proper thing to do after the puppy is four weeks old. I do not believe it should be taken from them. After four weeks you can begin with the meat diet, and gradually decrease the milk and increase the meat, because the meat diet calls for an acid digestion and the acid digestion itself prohibits milk digestion.

DR. E. E. PATTERSON: There is one thing in Dr. McClelland's paper with which I do not agree. Dr. McClelland fails toadvise not to give the dogs all the water they want. Now, that has been one of the conditions we have had to contend with in our city. To the majority of dogs coming into the hospital, they give all the water they want. It is one of the bad features. The attendant usually will stick in a great big pan of water, and the result is the dog vomits it right away. I would like to have Dr. McClelland enlighten us on that point.

DR. MCCLELLAND: While all of us who have hospitals find that condition, I think you will also find that the perfectly normal dog, under normal conditions, will not drink too much water. I think I mentioned in my paper that in any of the dietary diseases, where there is gastritis, dogs crave water all the time, and water for those cases should be very much restricted, because if they get any quantity at all it makes them vomit more. It is a little hard to explain why dogs brought into a hospital, after they have been there awhile, drink too much water and vomit. It is one of the hardest things in the world to keep a normal dog housed in a kennel and keep him healthy at the same time. He will drink a large quantity of water and begin to vomit, and I think it is a good thing to restrict the amount of water given to dogs that are kept shut up in a cage in a hospital. We always supply lime water in the drinking-water, or a little bit of salt.

DR. E. C. CLEVELAND: Do you think the drinking of water by a dog causes stomach disorders?

DR. MCCLELLAND: I think it causes a slight form of gastritis, and that makes the dog drink too much water.

DR. CLEVELAND: I hardly understand why the dog should not have all the water he wants.

DR. PATTERSON: It has been my experience that if a dog drinks too much water, as soon as he eats he throws everything right up. That is a common occurrence in our hospitals. We find that a change of diet and a restriction of the water he drinks will overome that. I cannot give the scientific reason, but it occurs nevertheless. In certain cases we do not give our animals all the water they want, but restrict them, and we find that after awhile they take the normal volume of water and then do much better. That has been my experience.

DR. A. A. ETIENNE: We find that where there are cases of gastritis, if we remove the water entirely and substitute in its place a large chunk of ice, the dog will only get a few drops of cold water, and we find that better than anything else. Just a chunk of ice, and be sure and let him lick the ice all he wants.

I do not quite agree with Dr. McClelland about giving him chopped meat. I have found out that our northern dogs are accustomed to eat raw meat, and we give it to them after it has been warmed up in an oven—large chunks of raw meat that they can tear. We have obtained good results in this way with the huskies and the Eskimo dogs and all those harness dogs in the North.

DR. C. G. ROHRER: Relative to the use of water with the dogs, I think that, in hospital cases particularly, water should be limited, because a dog in a hospital is there for some reason. In the home, if the dog is perfectly healthy, I believe the customary supply of water will not hurt him at all, because we

know that the body is composed of a big percentage of water, and if the animal is not supplied with that there is something wrong.

Relative to the meat diet, I find that chopped meat, as Dr. McClelland mentions, is much better for the first feed following gastric conditions; in fact, much better than what the gentleman from Canada spoke of as chunks. I find too often that chunks of meat will really irritate that sensitive tissue, which ground meat will not do.

Beef tea is really much better in cases where they will not take the straight meat. If the patient is at home, put some lean meat in a double boiler, with no water, and get the pure juice, and give that every few hours, and that will greatly help the animal.

Dr. Alex Glass: In reference to the use of water I find that, especially in the use of water for canines in the home, the trouble is they have bowls of water sitting around the room on the floor, in various rooms and in various temperatures, and probably containing, or being contaminated with, all kinds of material floating through the air. I have known these water-dishes not to be washed for five or six days, only occasionally being dumped out and then being filled up with water again without being washed, but the dog has no other recourse than to go there for his water. I find no trouble with the water supply if it is given to the dog at regular intervals and out of clean containers so that the water is wholesome.

Then again, you will find some waters in some communities very hard and alum-treated. Often dogs are neglected, and I put them on good, pure, soft spring water. Buy bottled water for them. I would make that suggestion—try bottled water and good spring water, soft water for your dogs, and do not have it lying around in dishes that are not clean. Ask your people to provide white enameled dishes, and have them thoroughly cleansed and the water supply changed, and you will have very little trouble with the normal dog. If he has gastric trouble and the dog vomits and discharges a large amount of mucous material on the floor, it is due primarily, not so much to the water, but to the fact that the dog has an irritated mucous membrane, and, therefore, when he takes water he has that abnormal desire because the mucous membrane is congested. In cases like that I believe in the restricted use of lime and spring water.

Dr. H. C. Rea: I believe in allowing the dog all the water he wants. If he has been fed on a rich diet he will have trouble with his stomach and will require a lot more water than the dog fed on a more restricted diet. If a dog vomits after eating he certainly has gastritis or some form of bowel trouble, and if he has diarrhea along with it, I think a little lime water would correct that condition. I do not believe in restricting water, because no two individuals are alike in their water requirements.

Dr. H. B. Balthaser: I differ a little bit from the last speaker in regard to giving the animals all the water they want, particularly the canine species. The reason I say that is due to the fact that we do not treat well animals, and we are not called upon to go and see well animals; they will take care of themselves. We men differ in the quantities of water that we consume. I know some men who do not drink water at all. If you are called upon to see a sick animal, where you have an abnormal intestinal tract, you will have to restrict the water of the animal or he will never recover, but the supply must be good. I restrict the water to an equal portion of the white of an egg; never use the yolk, and you will supply the albumin the same as you do in meat, and they will drink it, and you will supply a sick animal that refuses food with valuable and nourishing albumin.

Another thing: Sometimes I will heat the egg, probably one minute or so and add then a pinch of salt to it or a pinch of sugar. Some animals like a little bit of sugar, which is contrary to what one of the speakers referred to awhile ago, but I do think it will aid digestion. A number of animals will refuse to eat, and when continuing to drink water they aggravate their condition.

Dr. Jos. De Vita: We all know that the requirements of the normal dog vary. Possibly the one with the hyperacid stomach will require more water than the one which has not that trouble. They vary with the diet. If he

has not had enough animal diet, he will require much more water than the dog that has had plenty of meat.

In cases where there has been diarrhea, the water is lost from the system so fast that sometimes a deficiency of water is responsible for this abnormal thirst. We must give them water in some form. You cannot sustain life, or expect nature to meet a pathologic condition, if you do not allow water for the chemical activities of the body.

DR. H. K. MILLAR: I agree with the last speaker. In many cases, however, I would administer the water through the rectum, in quantity. Again I would encourage the use of albumin cooked. It is indigestible raw. There is a nutritional authority here in this country of whom I think considerable. Their laboratories are located in Omaha, Nebraska, and they have done much work in the way of nutrition in human beings by experimenting on dogs. I have seen a number of dogs in these laboratories, after having been kept under observation ten days, when they are in health, put away without food and without water 64 days up to 80 and some-odd days, and ten days to two weeks after they were started again on food you never would know they had been on a fast. So much in regard to feeding or forced feeding in cases of distemper.

U. S. CIVIL SERVICE EXAMINATIONS

The United States Civil Service Commission announces the following open competitive examinations:

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Applications for the two positions first named must be on file with the Civil Service Commission, at Washington, D. C., by June 26. For the latter two, by June 27.

The entrance salary or the salary ranges are given above. Examinations will be held about fifteen days after the close of receipt of applications.

Full information concerning the duties in connection with these positions, examination ratings, etc., may be obtained from the U. S. Civil Service Commission at Washington, D. C., or the secretary of the U. S. Civil Service board of examiners at the post office or customhouse in any city.

ULTRAVIOLET IRRADIATION OF PRIMATES WITH A FORM OF CAGE PARALYSIS RESEMBLING RICKETS*

By CHARLES V. NOBACK

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Lemurs of Southeast Africa, Old World monkeys and apes, together with the marmosets and sapajou, howling, spider and squirrel monkeys, of the New World, are included among the primates. Other forms may be found at times in zoological collections. The object of this paper is to describe briefly a form of "cage paralysis" resembling rickets which is found in primates kept under artificial conditions of captivity, and to report on the results obtained with ultraviolet irradiation in the treatment of this condition.

The following are among the known conditions concerned in the etiology of rickets (Hawk & Bergheim[1]):

1. A deficiency in the diet of the "antirachitic factor" or a lack of available radiant energy in the form of ultraviolet or perhaps cathode rays. (Regarding cathode rays, see reference 10.)

2. A deficiency in the diet of available calcium or phosphorus, or both.

Clinicians and practicing veterinarians, Law,[2] Hoare,[3] Hutyra and Marek,[4] have generally recognized the value of sunlight, a diet containing available calcium and phosphorus, and cod-liver oil as important aids in the prevention and treatment of rickets. The recent findings of a number of investigators, like Hess,[5] Steenbock and Black,[6] and Rosenheim and Webster,[7] regarding the antirachitic value of cod-liver oil, show that its oily portion has no antirachitic value whatever but that a non-saponifiable residue of this oil has a very strong antirachitic value. This residue has been found to consist largely of an activated form of cholesterol obtained by the cod from feeding on various forms of life that have been exposed to the influence of the ultraviolet rays in sunlight. In short, radiant energy has been found to be the source of this antirachitic value. Further study by these workers indicates that cholesterol contains a substance, which they call ergosterol, which contains this "factor." Hess,[8] Steen-

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bock[9] and others have imparted antirachitic properties to cholesterol through direct irradiation with ultraviolet light (spectrum line 3020 A. U.). Another important discovery has been made recently, by Knudson and Coolidge,[10] in reporting that they have been able to impart antirachitic properties to cholesterol, yeast and other substances by irradiation with cathode rays. As investigations and studies are being carried on by various workers in this field a final statement as to the exact carrier of radiant energy cannot be made at the present time.

The expression, "cage paralysis," when used in its general sense, may refer, as the writer has stated in a previous paper,[11] to the earlier stages of any one of the following conditions: rickets, osteomalacia, osteitis deformans (Paget's disease), diseases of the spinal cord, rheumatism, or superficial injuries to the spine. The present discussion will be confined to that form of "cage paralysis" which in its response to ultraviolet irradiation closely resembles rickets.

History

The general history of cases of this type will be found to be somewhat as follows: The client will tell of having purchased or received a monkey, marmoset or lemur which, if received during the summer months, may remain healthy and active until some time during the late winter or early spring. About this time these pets may be brought either to a zoological park as "gifts" or to a veterinarian for treatment. In some instances it will be found that the diet has consisted largely of cakes, crackers, tea or coffee, candy, with some milk and possibly fruits. As a result of overfeeding with crackers and cakes, the animal receives an inadequate amount of nourishing food. Further, in a desire to keep the pet warm and comfortable during cold weather, it is kept indoors, away from the beneficial influence of direct sunlight. Where the animal is kept behind an ordinary glass window it may receive the warm rays of the sun but is deprived of the ultraviolet rays because these are absorbed by ordinary window glass.

When a case of this type is brought to a veterinarian, his client will usually tell of how healthy and happy the pet was until a month or so ago, when it began to be less active than usual. Frequently the client will relate how the pet either fell or was injured over the back, and that since the accident it had been lame and weak in the posterior extremities. More

advanced cases will present animals which are unable to use the posterior extremities at all. On close investigation it will be found that the diet was deficient and that the animal was kept indoors away from fresh air and sunlight. In hopelessly advanced cases treatment is practically useless.

It will thus be seen that two important factors which enter into the etiology of experimental rickets are present, namely, first, an inadequate or deficient diet containing a minimal amount of available calcium or phosphorus and, secondly, a lack of exposure to ultraviolet rays or a lack of the antirachitic factor necessary to carry on the calcium and phosphorus metabolism.

Symptoms

The following group of symptoms may be associated with the term "cage paralysis": a progressive weakness in the posterior extremities, manifested at first by a disinclination on the part of the animal to move about; a gradual development of stiffness, which on superficial examination closely resembles rheumatism; finally there is a loss of power in the hind limbs with atrophy of the muscles. A slight enlargement of the joints may be found on palpation, together with a kyphosis and bowing of the legs. Decubital ulcers may form, due to inability of the animal to change its position. The course may be chronic and persist for a few months, ending eventually in a terminal pneumonia or enteritis.

Mild cases of "cage paralysis" have been treated by changing to a suitable diet and the careful administration of cod-liver oil. Cod-liver oil is nauseating and some animals frequently refuse to take it. When given in sufficient amounts for treating this condition, it frequently proves to be laxative and is thus not satisfactory. Irradiation with ultraviolet light has proved to be a valuable aid in treating several cases at the New York Zoological Park.

At the thirty-seventh annual meeting of the New York State Veterinary Medical Society, on June 28, 1927, the writer reported on favorable results obtained through direct ultraviolet irradiation in five cases of "cage paralysis" in primates. The favorable results obtained led the writer to believe that this condition closely resembles experimental rickets. It will be necessary, however, to demonstrate a low concentration of calcium and phosphorus in the blood-serum and to obtain X-ray evidence of deficient calcification of the bones in untreated

cases in order to show a closer resemblance to experimental rickets.

Case Report

The description of a typical case which follows was taken from our case records:

Case 1: A male Red Howler monkey (*Mycetes seniculus*) was brought to the New York Zoological Park from British Guiana, on April 28, 1925. This species of monkey is very delicate, and usually does not survive very long in captivity. Lydekker[12] states:

> The Red Howler is one of the two species of this genus (*Mycetes*) that have been exhibited in the Gardens of the London Zoological Society. It is, however, difficult to keep alive for any length of time, and of the two specimens received from the Dekka River, near Cartagena, on August 28th, 1863, the one died on September 25th, and the other on October 7th of the same year.

Mitchell[13] gives the average duration of life in captivity as approximately three and one-half months, and the maximum as thirteen months. Elliot[14] classifies this species under the genus Alouatta (*Alouatta seniculus*) and regarding its ability to survive in captivity, states the following:

> Their movements are slow and their temper sullen, and the animal is practically untamable, and *soon dies when held in captivity.*

The relation of food to health is obviously of fundamental importance. As soon as the Red Howler monkey arrived, the question of what to feed him occupied the attention of those in charge. Acting upon the suggestion in Lydekker[15] that "the food of these monkeys is stated to consist entirely of leaves," he was fed on a diet of young leaves, such as wisteria, grape, oak and Japanese red maple.

He was kept in a roomy cage, near a large window. During the late fall, winter and early spring, his diet consisted largely of oranges, bananas, lettuce, some leaves from sprouting acorns grown under ordinary glass, plums, grapes, cherries and diluted condensed milk.

During the latter part of November, 1926, after he had been in captivity for nineteen months, he became listless and could not move about as easily or as readily as usual. His hair became rough and lost its luster. His eyes were dull and expressionless. He would sit on his perch, huddled up like a decrepit old man, and took no interest in what happened about him. The posterior extremities were weak and stiff. In the course of a few weeks he could hardly climb about his cage, and then only slowly and

with great difficulty. He developed a typical case of "cage paralysis." It should be noted that he had not been receiving his green leaf diet, and that the few sprouting leaves from acorns that were fed him were grown under ordinary glass.

Direct ultraviolet irradiation was begun on February 9, 1927. It was applied directly to his back, as he sat on his perch, because he was too weak and stiff to move. The light from a standard alpine sun lamp was placed at a distance of 24 inches from the animal for a period of fifteen minutes. The time of exposure was extended to thirty minutes after three days, and was continued daily until March 11, 1927 (thirty-one days). During the first week there was no visible improvement whatever. He apparently remained as weak and stiff as before. The only change noted was that the condition of his hair seemed to improve a little. It seemed to become smoother. There was a very slight improvement at the end of the second week. The animal moved about slowly but apparently a little more easily. It stretched its legs. It was not until the end of the third week that the improvement was definite. Its coat of hair became smooth and glossy. The ability to move about improved to such an extent that his keepers were surprised at the apparent recovery. Direct irradiation was discontinued on March 11, 1927.

In order to insure the improvement, the animal was given irradiated dried whole milk (Klim). The dried milk was irradiated for thirty minutes at a distance of 12 inches, according to the technic of Hess for cholesterol.[8] Reference is also made to the work of Steenbock and Daniels[9] regarding the irradiation of food. At first, five grams of the irradiated dried milk dissolved in water was fed daily. The amount was later increased to ten grams.

Improvement continued steadily and the animal soon was able to move and jump about the cage with agility. The eyes became brighter and clearer. It played with its keepers for the first time in several months. During the first week in May, he was fed some young wisteria leaves. Later he was fed young grape and Japanese red maple leaves. At present, he is back on his leaf diet, although he still receives ten grams of irradiated milk every second day.

In addition to the Red Howler monkey (*Mycetes seniculus*), a Grivet monkey (*Cercopithecus griseoviridis*), a brown lemur (*Lemur mongoz*) and two ring-tailed lemurs (*Lemur catta*) were treated for apparently the same condition, with direct ultraviolet

irradiation only. In the course of from three to four weeks, they recovered and are now apparently normal. The latter cases did not receive irradiated dried milk.

The form of treatment carried out in the case of a marmoset brought to the Park may be of interest. "Cage paralysis" developed during April, 1927. As it was impracticable to use the alpine lamp in this case, it was recommended that the animal be permitted to remain in direct sunlight as much as possible every day and to administer cod-liver oil in small amounts. The oil was to be omitted whenever a laxative effect was noted. This procedure was carried out with an uneventful recovery.

The condition described has been found to be more prevalent among monkeys kept in city apartments, where they do not have access to direct sunlight and fresh air and where proper attention is not given to their diet. Those which are kept under more favorable conditions, as in the country or in the suburbs, and have access to sunlight, fresh air and are properly fed, seldom develop this condition.

Clinical cases are favorably influenced by direct ultraviolet irradiation from an alpine sun lamp and by feeding a suitable diet. As in the case of most diseases, preventive measures are more satisfactory.

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Discussion

Dr. F. G. Steinbach: Will an indirect method of irradiating food accomplish the same effect as direct?

Dr. Noback: Investigators have found that various foods, such as dried milk, acquire antirachitic properties through ultraviolet irradiation. The same effect might be obtained by feeding irradiated food as that obtained from direct irradiation. Our observations, however, have been confined to the use of direct irradiation in the type of cases mentioned in the paper.

DR. STEINBACH: I have had experience with weak animals suffering in the way Dr. Noback pointed out, that have had cholera and also vomiting after food. I do not remember the name of the investigator, but they even irradiated the sawdust on which the litter played around, and it had that effect.

DR. NOBACK: Rosenheim and Webster, in the *Biochemical Journal* (Vol. 20, pages 1340-1341, 1926), report that they have succeeded in obtaining a resin from irradiated sawdust which was antirachitic.

DR. STEINBACH: How long do you suppose irradiated food, for instance, such as dried buttermilk or dried skim milk, would retain that factor?

DR. NOBACK: Hess has stated that irradiated dried milk has been found to retain its antirachitic property for more than sixty days.

DR. GEO. W. LITTLE: Do you not get a similar condition when you get paralysis (tuberculosis?)? It seems to me in irradiating cases you have to eliminate the possibility of tuberculosis. Otherwise, your results will not be uniform.

DR. NOBACK: The incidence of tuberculosis among the primates at the Park is practically negligible, due primarily to the following reasons: (1) The animals come directly from their native habitats and are not exposed to the disease. (2) Each new animal is kept under observation in quarantine before being placed on exhibition. (3) A limited number of animals are placed in a cage and a high wire screen, nine feet high, in front of the cages, prevents possible infection from visitors. (4) The food supply is under careful inspection. Condensed milk and dried milk are used in place of loose fluid milk, thereby eliminating the possibility of infection from this source.

It frequently happens that monkeys which are kept as pets develop tuberculosis through infection by contact with tuberculous individuals or contaminated milk. In such cases it is necessary to destroy the animal for sanitary reasons.

The cases mentioned in the paper were free from tuberculosis.

ON THE WAY TO MINNEAPOLIS

Many Glacier Region, Glacier National Park.

LYMPHOSARCOMA OF THE BOVINE ABOMASUM

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Perhaps one of the most common of the internal neoplasms of cattle is the highly malignant tumor known as lymphosarcoma. While lymphoid tumors may arise in a great many different situations within the abdominal cavity of cattle, they appear to possess a peculiar predilection for the tissues of the abomasum. It is my opinion that this tumor occurs often enough to warrant a description of its various aspects in view of the paucity of information pertaining to it in the available literature on comparative pathology.

Hutyra and Marek,[1] in discussing tumors of the abomasum, mention a large variety of epithelial neoplasms that may involve this structure and state that "diffuse lymphadenoid infiltration" may be met with. Just what these writers had in mind that could be described as "lymphadenoid infiltration" is not revealed. It is possible that they intended that this term should describe lymphosarcoma of the true stomach, since in some respects this disease resembles lymphadenoid infiltration. Kinsley[2] mentions two cases of lymphosarcoma of the ox in which the primary lesion was in the wall of the abomasum. Law[3] devotes small space to tumors of the stomach of cattle and fails to consider sarcoma in this organ. Under the caption, "Carcinoma," he writes: "In cattle 'scirrhus' of the abomasum is described." Since "scirrhus" is an old term used to designate a firm, hard type of cancer with a predominance of connective tissue, it is impossible to tell from Law's remarks what definite neoplastic entity he had in mind.

The following statement concerning sarcoma is taken from a publication[4] of the United States Department of Agriculture: "Sarcoma is about the most frequent and dangerous tumor that is found in cattle. It occurs in young animals, and is found on the serous membranes, in the glandular organs, and on the outer skin, especially of the neck and shoulders . . . in fact in nearly every tissue and in almost every part of the body."

Joest[5], while failing to mention lymphosarcoma in the abomasum specifically, states that the submucous region is among

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the most common sites of sarcoma in mammals. Fox[6], in a review of ninety-four tumors of captive wild animals, did not encounter this type of tumor in any of the specimens examined.

It is obvious that little has been written about this serious malignant tumor of cattle, yet the veterinarian with a considerable dairy practice must often encounter this disease. The symptoms are usually vague if not obscure and it is quite likely that many, if not most, of the cases go undiagnosed. Unfortunately necropsy is the exception rather than the rule in the case of the larger domestic animals and without it the presence of this tumor cannot be proved. The failure to conduct an examination of the carcass of an animal which has died on the farm is not due in every instance to the veterinarian, although more necropsies could be secured if veterinarians were more interested in the pathologic changes in animals.

Report of Cases*

Case 1: A ten-year-old Holstein dairy cow had been in poor physical condition for four weeks previous to death. Two weeks earlier she lost a large quantity of blood by accidental amputation of the tail. One week before death, she gave birth to a calf three weeks before term, which, although it was weak, appeared normal and lived. The cow died from obscure causes and necropsy was performed. The small intestine, mesentery and abomasum were extensively involved in a tumorous process. The uterus also was slightly affected. The walls of the ventricles of the heart contained large masses of tumor tissue.

Case 2: The animal was a Holstein cow, aged five years. She had lost weight and exhibited inappetence; the secretion of milk had gradually decreased. The temperature through the course was approximately normal. She had been definitely ill for about ten days and death came suddenly before a definite diagnosis had been made. Necropsy revealed "large masses of lymphoid-like tissue in the walls of the abomasum, extending along the duodenum and proximal portion of the jejunum." There was metastatic extension of the disease to the mesenteric, hepatic and mediastinal lymph-nodes and also to the pelvis of the left kidney, the left ureter and the myocardium. Two large ulcers, measuring 4 and 6 cm. respectively, were found in the mucosa of the abomasum. (Originally described by Schlotthauer.[7])

*Since this was written we have studied three other cases which presented characteristic lesions of the disease.

Case 3: This was a ten-year-old Guernsey cow which had been in apparent health until about three weeks before death. The onset of the disease was sudden and the symptoms were few and not characteristic. Although the animal ate little, she continued in fairly good flesh until death. The temperature at times was subnormal, while the pulse was rapid and quite irregular. Near the termination of the disease the animal was reluctant about moving and finally went down as if paralyzed in the hind quarters. Necropsy revealed a tumorous thickening which extended throughout most of the abomasum with large fleshy masses over the wall of the reticulum. The wall of the abomasum was 3 cm. thick. The dorsal abomasal lymph-nodes were greatly enlarged. The walls of the auricles were extensively involved; they were thickened to as much as 2.5 cm. by the tumor tissue which projected through the endocardium as small wart-like elevations. A number of shot-like clusters of tumor tissue were present over the exterior of the auricles.

Etiology

The exact primary cause of this disease has not been found. The explanation of the initial proliferation which eventually becomes a tumor will probably not be determined until the cause of cancer is finally established. Unfortunately the pathologist is never accorded the opportunity of seeing these tumors during their initial stages. If it were possible to study material in which the first neoplastic elements could be seen and identified, much light might be shed on the cause of this condition.

As an etiologic factor, perhaps only contributory in nature, ulceration of the mucosa of the abomasum is suggested. In two of the cases reported, ulcers of this tissue were well established (fig. 1). The exact role of ulceration, in the causation of the tumor, is somewhat difficult to determine since it is easier to explain the ulcer than to prove any relationship between the ulcer and the cause of the tumor. In case 3 it is hardly likely that the ulceration preceded the tumor. It would seem more logical to presume that the ulceration occurred because the tumor interfered with the function of the organ involved. Certainly the extent to which the tumor involves the submucous region is highly suggestive of such a possibility. It is difficult to believe that this tumor originates from normal lymphoid tissue in the submucosa of the abomasum, since this coat apparently possesses little if any such tissue. The origin of the tumor

from unrestrained cells which were originally part of a mild, long-continued inflammatory reaction is possible but extremely difficult to prove. It is certain that all inflammatory lymphocytes do not suffer a loss of restraint and become malignant, but tumors do occasionally arise following trauma or other irritating influences. Although some of these factors might be related to the etiology of this disease, definite evidence is lacking and, without these, suggestions are purely speculative.

The influence of age, breed or sex has not been noted.

Symptoms

The symptoms of lymphosarcoma of the abomasum are certainly not pathognomonic. While a few rather constant functional manifestations of the disease are usually noticed, positive diagnosis would be extremely hazardous in any given case on the symptoms alone.

Fig. 1. Case 3. The large circumscribed ulcer in the mucosa of the abomasum.

The onset is usually sudden and the duration comparatively short. Probably the first symptom will be inappetence followed by loss of weight and a decrease in the flow of milk if the animal is lactating. The animal is disinclined to move, appears listless and disinterested in its surroundings. Slight diarrhea may appear and if ulcerative gastritis is present the feces may con-

tain blood. As the disease progresses, persistent bloating may prove troublesome. The animal gradually becomes weaker and prefers a recumbent position. Weakness of the hind legs may develop, as a consequence of which the animal is unable to rise or to stand if assisted to its feet. If the heart is involved by metastasis the pulse may be rapid and irregular. There are no cytologic or chemical changes in the blood. Fever has not been observed, but the temperature was subnormal in one of the cases described. The animal becomes progressively weaker and thinner, and death usually occurs in from two to four weeks after the initial symptoms.

Differential Diagnosis

In some regards lymphosarcoma of the abomasum suggests traumatic pericarditis. There are, however, a few important differential points in the two conditions.

Fig. 2 Case 3. A cross-section through the wall of the abomasum, showing the fleshy tumor tissue between the mucosa and the muscular coat. Note the thickness of the structure.

The prolonged digestive upset which antedates the cardiac symptoms of traumatic pericarditis is not found with lymphosarcoma of the abomasum. Neither is there evidence of pain on percussion over the region of the midventral posterior portion of the thorax, which is usually so noticeable in the traumatic type of pericarditis in cattle. Traumatic pericarditis usually produces elevation of temperature and leukocytosis is often present. Neither of these symptoms is associated with tumor nor does lymphosarcoma of the abomasum provoke the jugular fullness associated with blood stasis and edema which are features of the final stages of traumatic pericarditis. The friction sounds in the cardiac region together with the splashing of the pericardial fluid are absent in the neoplastic disease. The two diseases differ considerably in duration. Lymphosarcoma usually terminates fatally in two or three weeks from the onset of symptoms while traumatic pericarditis runs a more prolonged course.

Lymphosarcoma of the true stomach may be confused with other malignant internal tumors of cattle, but the possibility is so remote as to be practically irrelevant in this discussion.

Pathologic Anatomy

When lymphosarcoma of the abomasum is suspected, necropsy should be conducted with the greatest care in order that possible metastatic foci may not be overlooked. The animal is seldom emaciated at the time of death. The seat of the primary lesion

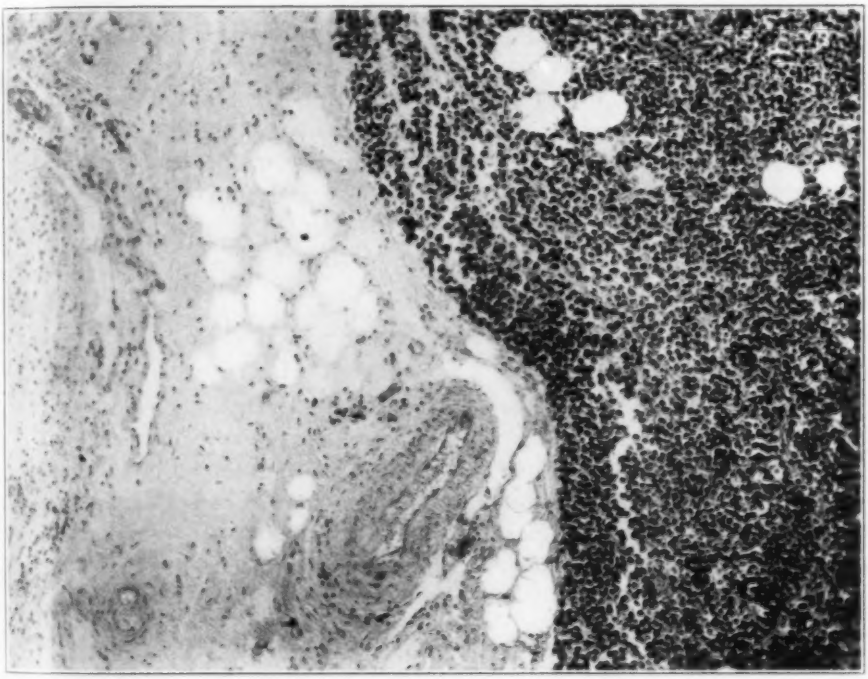

Fig. 3. The cells of the tumor confined to the submucous region, with no tendency to involve the muscular layer.

is the submucosa of the abomasum (fig. 2). The tumor may involve practically any portion or all of this structure and is often found extending through the pyloric portion into the submucosa of the duodenum and occasionally even to the proximal portion of the jejunum. The tumor is of firm texture and rather flesh-like in appearance.

A peculiar feature of this neoplasm is that, although it exhibits practically every character of a vicious malignant lesion, it has not been observed to violate the mucosa or the musculature of

the abomasum or intestine. The growth is confined to the submucosa which may be many times thicker than normal (fig. 3).

Metastasis is one of the features of the disease, and quite common. The dorsal abomasal lymph-nodes, as well as the hepatic, mesenteric and mediastinal nodes, may all be involved. The effects of metastasis may be seen under the capsule of the kidneys, in the ureters, uterus and heart. When the heart is involved a most striking picture results, which accounts for any cardiac irregularities noted in the clinical history. The tumor cells may infiltrate the myocardium in a diffuse promiscuous fashion, producing irregular nodular elevations over the auricles. The tumor tissue may give a roughened nodular contour to the endocardium of the auricle, and small polyp-like masses are occasionally seen hanging from the endocardial lining. Metastasis to the lung has not been observed, which seems peculiar in view of the possibility of dissemination of the tumor cells by the bloodstream. Irregular, flattened deposits of tumorous tissue may occur under the peritoneum of the abdominal wall and diaphragm.

Pathologic Histology

The type cell of this tumor is the same as that designated "large round cell" by the older pathologists. These cells are undoubtedly lymphoid in nature and their general appearance and clinical behavior justify the belief that the tumor that results from their proliferations is a lymphosarcoma. The cell is irregularly spherical, with a narrow zone of cytoplasm surrounding an eccentric nucleus. The nucleus, which constitutes most of the cellular bulk, is spherical and is strongly basophilic. An abundance of chromatin is distributed as small granules throughout the nuclear substance. Nucleoli are seldom observed. Mitosis is usually a striking feature of this type of neoplasm and frequently several cells showing different phases of this phenomenon can be observed in a single field (fig. 4). The cells vary considerably in size as do those of most rapidly growing malignant tumors. This seems to indicate an immature, undifferentiated type of cell.

The cells are laid down in compact formation, with no tendency toward an alveolar type of architecture (fig. 5). A few delicate strands of fibrous stroma may be demonstrable, but this material is usually scant. Definite blood-channels are difficult to discern, the blood present appearing to be in direct contact with the

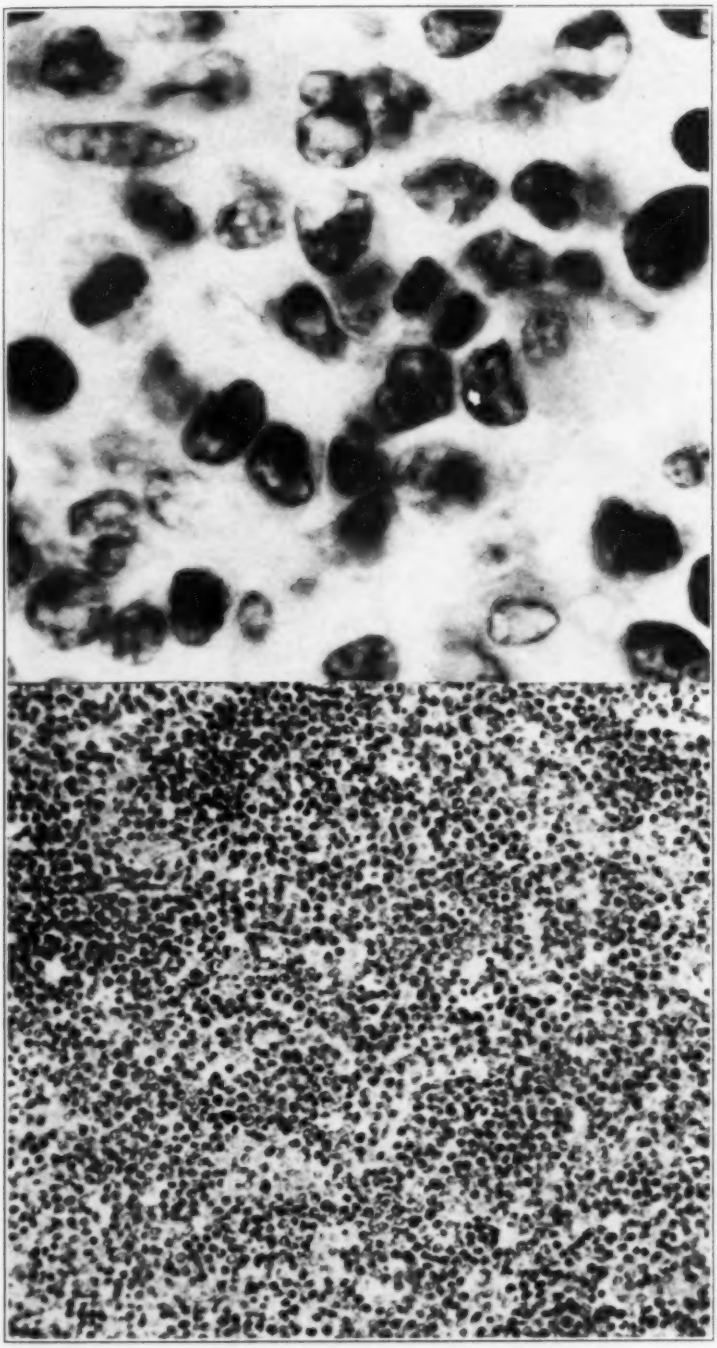

FIG. 4. (Above) The immature-appearing tumor cells, with several cells in different phases of mitosis, x 1400.

FIG. 5. (Below) The diffuse distribution of the tumor cells, with scant stroma evident.

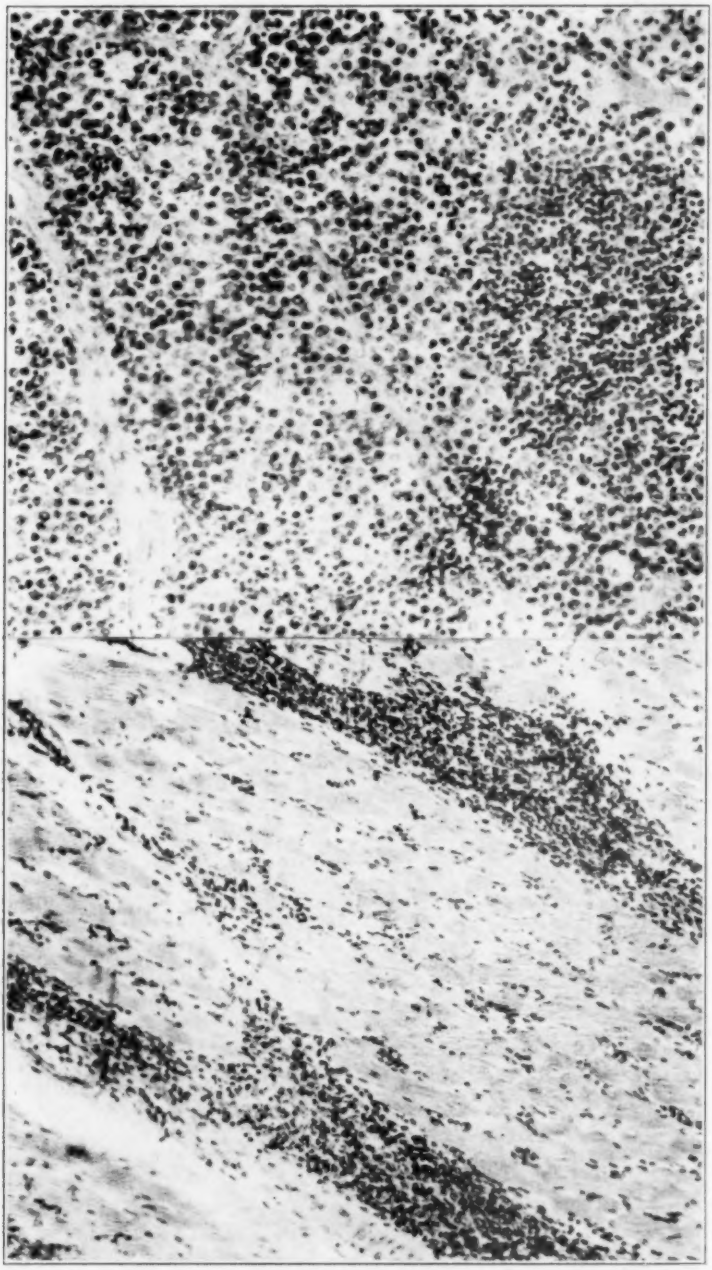

FIG. 6. (Above) Tumor cell which have metastasized to one of the dorsal abomasal lymph-nodes. Only a small amount of lymph tissue remains.

FIG. 7. (Below) Metastasis in the myocardium.

tumor cells. In the larger specimens small areas of necrosis may be present occasionally. A capsule is never produced, apparently because the cells grow too rapidly.

When lymph-nodes are invaded, the tumor cells soon replace the lymph tissue and sections often reveal only the slightest traces of the original structure (fig. 6).

Involvement of the myocardium causes destruction of the muscle fibers and their replacement by compact masses of tumor cells (fig. 7). Hydropic degeneration is often seen in the muscle fibers adjacent to an area of destruction. That the tumor cells are able to infiltrate and replace striated muscle fibers is clearly demonstrated in the heart; that they are unable to infiltrate smooth muscle is as clearly demonstrated in the true stomach and intestine.

Summary

There are but few references in the literature of veterinary medicine and comparative pathology to lymphosarcoma of the bovine abomasum, which is perhaps one of the most frequent internal neoplasms of cattle. Observations and studies establish lymphosarcoma of the bovine abomasum as a definite pathologic entity.

The course of the disease is comparatively short and always fatal. The clinical symptoms simulate, in some regards, those of traumatic pericarditis.

In its primary situation the tumor occupies a position in the submucosa of the abomasum, from which it may extend to the submucosa of the duodenum and jejunum. Metastasis is usually multiple and often widespread, with the heart showing the most striking lesions.

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STUDIES IN SO-CALLED "SKIN-LESION" TUBERCULOSIS

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In a previous article[1] it was pointed out that several factors seemed to indicate that the so-called "skin-lesion tuberculosis" in cattle might be caused by other acid-fast microorganisms than the bovine tubercle bacillus. These factors are:

1. Reactors with skin lesions only are at times found in herds in which there is no history of tuberculosis.

2. The acid-fast organisms usually present in skin lesions do not grow on culture media favorable to the growth of mammalian tubercle bacilli, a condition which was encountered in the cultivation of the acid-fast microorganisms of Johne's disease and leprosy.

3. The reaction to mammalian tuberculin is often atypical, which suggests a group, rather than a specific mammalian tubercle bacillus, sensitization.

4. This condition apparently is more prevalent in some localities than in others.

In the previous article was described also the skin-sensitiveness to tuberculin produced in guinea pigs by various saprophytic acid-fast microorganisms. It was observed that three acid-fast microorganisms, the *B. phlei*, the mist bacillus, and the "hog-skin" bacillus, produced fairly well-marked reactions to mammalian tuberculin.

Accordingly these three saprophytic acid-fast bacilli, together with one strain each of avian, human, and bovine tubercle bacilli, were used in an experiment with six cattle to determine if any of the organisms in question were capable of producing lesions similar to those commonly described as "skin lesions."

PREPARATION OF INOCULUM

Fifty milligrams, moist weight, of growth on glycerin-agar medium of *B. phlei*, mist bacillus, and "hog skin" bacillus, and avian and human tubercle bacilli, were suspended each in 5 cc of physiological salt solution. With the bovine bacillus, tissue of a guinea pig affected with bovine tuberculosis was emulsified

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with distilled water and filtered through sterile gauze. Microscopic examination of the emulsion showed a few individual acid-fast microorganisms. This method of preparing the bovine type of inoculum was used in preference to the culture growth on account of the difficulty of obtaining suspensions of the latter free from clumps.

Preparation of Site of Inoculation

An area about one inch in diameter on the outer surface and one inch above the fetlock joint on the left fore leg and the left hind leg of each bovine animal was cleansed and shaved. With the blade of a scalpel, the surface was abraded until serum exuded.

The six cattle used in this experiment were from one to one and one-half years of age and were negative to the tuberculin test. The inoculation was made by dipping a sterile glass rod into the inoculum and rubbing on the scarified areas, one animal being treated with the *B. phlei*, one with the mist bacillus, and so on. This series of inoculations was made on April 26, 1926. The scarified areas healed gradually and, within 30 days, with one exception, were covered with hair. At no time during this period was there inflammation or other mark to indicate an infection of the skin.

On June 1, or 35 days after inoculation, it was noticed that the scarified areas on the animal inoculated with the bovine type of tubercle bacillus were slightly roughened, dry, and thickened. This condition persisted during June and July. On August 1, the roughening appeared to be resolving and, on August 15, the scarified areas were barely perceptible, the site on the fore leg being bald, while that on the hind leg was covered with hair.

On August 24, the six animals were tested intradermally with tuberculin. Only one reacted, this being the animal treated with bovine tubercle bacillus. This animal, within 24 hours, gave a thick 5X reaction. Due to the intense tuberculin reaction and the apparent healing of the skin lesions, it was deemed advisable to kill the animal, in order to ascertain whether the sensitization to tuberculin was the result of the lesions produced at the sites of inoculation or whether there were also internal lesions. Accordingly, on September 2, 1926, it was killed and the postmortem examination revealed the following:

> Site of scarification on left hind leg was concealed by hair. The inner surface presented no mark of differentiation from surrounding skin. In incision, there was no sign or vestige of tuberculous involvement.

The scarified site on left fore leg presented practically the same appearance, with the exception that the outer surface was bald. The skin itself showed no tuberculous involvement.

The left prescapular lymph-gland was enlarged and contained two tuberculous areas, each about 1.5 cm. in diameter, well organized, yellowish in color, and gritty on incision.

Left popliteal lymph-gland was about 2 cm. in diameter and almost completely tuberculous. The lesion was slightly calcified and bright-yellow in color.

Posterior mediastinal lymph-glands contained two tuberculous areas, each about 1 cm. in diameter, in each of which were a number of whitish tubercles, varying in size from barely macroscopic to 2 mm. in diameter.

A microscopic examination of these tuberculous lesions showed the presence of acid-fast organisms, and guinea pigs inoculated from each of the lesions died of generalized tuberculosis within two months.

On September 9, 1926, the remaining five calves were again treated, each with the same acid-fast microorganism. The inoculating suspension was prepared in the same manner as previously described, and the inoculation was made in the same sites, but the method of inoculation differed in that the suspension was injected into the skin with a 20-gauge needle. The needle was introduced as parallel as possible to the surface and several punctures were made in each site. No lesions were elicited in the skin in any of these animals as a result of this series of inoculations, and the intradermal tuberculin test, made Nov. 22, 1926, or 3½ months later, was negative in each animal.

On December 15, 1926, the five animals were reinoculated, 2.5 mg. of the respective acid-fast microorganisms suspended in 1 cc of physiological salt solution being injected under the skin of the same regions previously treated. In the case of the human virus, only 0.5 mg. was injected at each point.

Only the animal treated with the human tubercle bacilli manifested a tissue reaction. In this animal an area about 2 inches in diameter at each point of injection became swollen and inflamed within five days. The lesion on the left fore leg developed into an open abscess, discharging a yellow, creamy pus for seven days, after which time it closed and both lesions gradually healed. Six weeks later, the swellings had entirely resolved.

April 15, 1927, or four months later, the animals were retested intradermally with tuberculin. There was no reaction.

Discussion

The failure of the three strains of acid-fast saprophytes, and the human, avian, and bovine types of tubercle bacilli to produce lesions of, or under, the skin of bovine animals simulating

so-called "skin lesions," following the inoculation of scarified skin, direct injection into the skin, and subdermal injections, would seem to indicate none of these bacteria to be the causal agent. It would be impracticable to draw such a conclusion, however, on account of the small number of cattle employed, the number of years the saprophytic strains had been under artificial cultivation, and other factors which will be referred to later.

These experiments, which might seem to be an indirect method of attacking the problem, were induced by our failure, in the laboratory study of approximately 20 sets of lesions during the past several years, to grow on artificial culture media, the acid-fast bacillus usually present in such lesions or to cause lesions on subinoculation into guinea pigs, rabbits, rats, mice, chickens, or cattle. It seems paradoxical that acid-fast bacteria present in cattle lesions did not, on reinoculation into cattle, reproduce the disease. It would seem plausible, therefore, to conclude (1) that the bacteria in these lesions were either dead or attenuated, or (2) that a special degree of susceptibility, either inherent or artificially produced, must be present in affected cattle.

That the bacteria in these lesions, if the assumption is correct that the bovine type of tubercle bacillus is the causal agent, should be dead is contrary to our present knowledge of the conduct of bovine tubercle bacilli in encapsulated lesions. While it is undoubtedly true that many tubercle bacilli die in tuberculous lesions, and that some lesions may entirely resolve without leaving a vestige, we feel safe in asserting, as a result of many hundreds of subinoculations into laboratory animals of tuberculous lesions in which bovine tubercle bacilli are present, that subinoculation of such tuberculous tissue invariably produces tuberculosis. We know of no case where an originally virulent bovine tubercle bacillus has been modified as a result of residence in a bovine animal. An interesting case in this connection occurred recently. A cow, which reacted to the subcutaneous tuberculin test eleven years ago and had failed to react on subsequent tests, was killed. On autopsy, several thickly encapsulated tubercles, each about 6 mm. in diameter, were found in a bronchial lymph-node. The content of the tubercles was firm and of the consistency of Swiss cheese. No tubercle bacilli were found on microscopic examination, but subinoculations of sections of these tubercles into guinea pigs caused generalized tuberculosis, fatal in two months.

The fact that it has so far been impossible to grow the organisms from the subcutaneous cattle lesions, with the exception of the one instance where Traum recovered an avirulent acid-fast microorganism, is not sufficient evidence to warrant the assumption that the organisms are dead. Similar conditions occurred in the cultivation of the bacillus of Johne's disease and of leprosy. In leprosy, the conditions were quite analogous to so-called "skin-lesion" tuberculosis, in that an acid-fast bacillus was usually present in the lesions, great difficulty was encountered in growing it artificially, and it has continued to be innocuous for all species of animals.

In connection with the assumption that the acid-fast microorganisms in subcutaneous cattle lesions are attenuated bovine tubercle bacilli, the comparison is made by Carpenter[2] to *lupus vulgaris* in humans, where the causal organisms tend to become attenuated after residence in the skin for several years. Dr. A. Stanley Griffith,[3] in a study of 140 cases of lupus, has shown that in 99 cases, or about 70 per cent, the tubercle bacilli recovered were avirulent. He also showed, in successive bacteriological examinations of the same lesion, that the causal tubercle bacilli, which at first were virulent, became avirulent after sojourn in the skin for several years. If such an analogy exists between tubercle bacilli in lupus and the causal agent in cattle lesions, the comparison ends there, since the tubercle bacilli of lupus can be grown artificially, while the acid-fast bacilli in cattle lesions are refractory; moreover, according to Calmette,[4] lupus can appear and develop only in already tuberculous individuals who have latent or occult lesions and it must be looked upon as a lesion of reinfection; further, lupus is a true affection of the skin, whereas cattle lesions are encapsulated nodules attached to the under layers of the skin. Carpenter[5] reported the formation of skin lesions by the inoculation of the skin of a calf with a suspension of virulent, bovine tubercle bacilli, but that the tubercle bacilli in the lesions remained virulent. He also stated that the inoculation of the skin of a bovine animal with the bovine tubercle bacillus did not result in internal lesions. This is contrary to the results obtained at this Station, where the inoculation of the skin with a relatively small number of bovine tubercle bacilli led to no permanent alteration of the skin but did produce internal lesions which could be traced directly to the points inoculated.

The incidence of reacting cattle showing only subcutaneous nodules on postmorten examination would suggest only a slight

susceptibility to the etiological agent. The location of these lesions would suggest the necessity of a primary skin abrasion to afford means of entrance, or to the possibility that we are dealing with an acid-fast microorganism with a predilection for this site.

Through the Tuberculosis Eradication Division of the Bureau of Animal Industry, statistics were gathered concerning the relation between "skin" lesions and internal lesions.

In 28 herds, comprising 1,075 animals, were found 59 reactors which exhibited skin and internal lesions simultaneously.

In 10 herds, comprising 655 animals, with 41 reactors, skin and internal lesions were found in the same herd but in separate animals.

In 38 herds, comprising 1,588 animals, there were 60 reactors which showed skin lesions only, and in 11 of these herds there had never been a history of tuberculosis.

The cases reported by Traum were in herds in which there was no history of tuberculosis.

In a personal communication, Dr. C. C. Walker, of Bath, N. Y., in whose territory these subcutaneous cases frequently are found, states that he has found these nodular-lesion reactors in many herds and that, more often than otherwise, skin cases are found in herds that have never been affected with true tuberculosis.

The aforementioned statistics show that skin lesions and internal lesions may be associated in the same animal and either may occur in different animals of the same herd; or skin lesions may occur unassociated with tuberculosis and in herds in which there is no history of tuberculosis.

In this connection, the term "skin-lesion" tuberculosis does not properly apply to the cases under discussion. In the more than twenty cases studied at the Experiment Station, the lesions were subcutaneous, attached to the under layer of the skin but not properly a part of the skin. By careful dissection, the lesion could be detached. In only two cases was there a connection between the lesion and the skin, and in these cases it was apparent that an abscess had formed in the nodule, discharging through an opening in the skin. Practically all veterinarians, with whom the author has conferred, agree that cattle lesions are subcutaneous rather than cutaneous. Traum[6] describes the lesions as follows: "The nodules are subcutaneous but the disease may penetrate the skin and discharge a creamy-colored, glutinous pus." The term "subcutaneous tubercular nodule" is suggested

in preference to "skin lesion"; subcutaneous, because the lesions are under the skin; "tubercular" is used in preference to "tuberculous," since the latter pertains more strictly to lesions caused by virulent tubercle bacilli.

Summary

1. The inoculation of the abraded skin of cattle with the bovine, human and avian tubercle bacilli, and three strains of saprophytic acid-fast microorganisms, and the injection into the skin and under the skin of the five last-named bacteria, failed to produce lesions of or under the skin.

2. The inoculation of the abraded skin with bovine tubercle bacilli, of the one bovine animal so treated, produced only internal lesions of tuberculosis.

3. The microscopic examination of over twenty subcutaneous tubercular nodules showed the presence in the majority of cases of an acid-fast microorganism.

4. All attempts to grow this organism on artificial media, or to cause lesions by subinoculation of sections of lesions into guinea pigs, rabbits, mice, rats, chickens, and cattle, failed.

5. Statistics are presented to show that internal, tuberculous lesions and subcutaneous tubercular nodules may be present in the same animal, also in the same herd but in separate animals; and that subcutaneous nodule reactors only may be found in herds in which true bovine tuberculosis has never occurred.

6. The term, "subcutaneous tubercular nodule," is proposed to replace the term "skin-lesion tuberculosis."

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STATE BOARD EXAMINATIONS

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Massachusetts Board of Registration in Veterinary Medicine. State House, Boston, Mass. June 27-28, 1928. Dr. E. W. Babson, Secretary, Gloucester, Mass.

COMPARATIVE AGGLUTINATING PROPERTIES OF DIFFERENT STRAINS OF BACT. ABORTUS (BANG)*

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The Kentucky Experiment Station tests the blood of about one thousand cows annually for infectious abortion. In the routine of this test, the blood of certain cows did not react positively to our stock antigen, made up of two strains of *Bact. abortus* (Bang) although the history of the cows indicated that they were infected with the Bang organism. The thought occurred to us that perhaps such cows would react to an antigen made up of a strain of the organism not found in the stock antigen. To get some data on the variable agglutinating properties of different strains of *Bact. abortus* (Bang), we began (June, 1926)† to carry on tests, as time would permit, of blood of individual cows with a number of antigens, in some cases amounting to twenty in number. The results show that a few cows will respond negatively to an antigen made up of a particular strain and positively to another strain of the organism. Then, too, we know that occasionally different results have been obtained by different laboratories in the testing of blood from the same cow. With two exceptions in the experiment here recorded, we used antigens from strains of *Bact. abortus* (Bang) isolated at this Station, some twenty in all. Some of these strains were isolated as far back as 1911, and a few as recently as 1926-27. In our routine work of testing cows for infectious abortion, we have for several years been using a stock antigen prepared by mixing two strains of *Bact. abortus* (Bang) which had been tested with our other strains against several samples of positive serum, the two strains mentioned having the highest agglutinative power in the tests made at that time.

In table I, giving the results of the tests in this investigation, the column at the extreme left gives the number of the herd; the next column gives the number of each of the cows tested in the herd; the next column gives the number of antigens in which the titer of the agglutination was below a 1 to 20 dilution; the

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†A brief report of the preliminary work of this investigation was given in the Annual Report of the Kentucky Agricultural Experiment Station for 1926.
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next column shows the number of antigens completely agglutinated in a dilution of 1 to 20; and the next column gives the percentage of agglutination in these same antigens in a dilution of 1 to 50 and which at the same time gave a complete agglutination of 1 to 20; the next column shows the number of antigens that were agglutinated in a dilution of 1 to 50; the next column the number of antigens that were agglutinated 1 to 100; the next column the number of antigens that were agglutinated 1 to 200; and the next column the number of antigens which were agglutinated in a dilution of 1 to 500.

As a key to the table, the blood serum of cow 1 in herd 1 was tested with 9 antigens, 8 of which were made up of a different individual strain of *Bact. abortus* (Bang). One antigen (stock) was made by using two strains of the organism as has been mentioned. Three of these antigens were agglutinated with a titer less than 1 to 20; one antigen was completely agglutinated 1 to 20, with a 90 per cent agglutination in a dilution of 1 to 50 and four antigens were agglutinated in a dilution of 1 to 500. The number of antigens used varied, however, with the blood of different cows as in case of cow 2 of herd 1, five antigens only were used. The number of antigens used varied from time to time according to the time at the disposal of the operator. With cow 5, herd 1, one antigen showed only a partial agglutination in a dilution less than 1 to 20 and three of the antigens were completely agglutinated in dilutions of 1 to 20 with a 90, 70, 70 per cent agglutination respectively in dilutions of 1 to 50; two of the antigens were completely agglutinated in dilutions of 1 to 50; two antigens were completely agglutinated in dilutions of 1 to 100 and one antigen was completely agglutinated in a dilution of 1 to 500. In testing the blood serum of cow 9 of herd 7, we used 20 different antigens, two of which showed some agglutination in a dilution of 1 to 20; twelve were completely agglutinated in a dilution of 1 to 20 with the percentage of agglutination in a dilution of 1 to 50 given in the next column. Three antigens were completely agglutinated in a dilution of 1 to 50, two antigens in a dilution of 1 to 100 and one antigen in a dilution of 1 to 200.

Agglutinating Properties Vary

As a result of these tests, we can plainly see that it is possible to pass a cow as a negative reactor with some antigens, while one prepared from a particular strain of the organism will be agglutinated in a high dilution. As, for example, in the case of

cow 36, herd 1, where three antigens were agglutinated in a dilution below 1 to 20; one antigen completely agglutinated in a dilution of 1 to 20 with a 75 per cent agglutination in the dilution of 1 to 50. According to our interpretation, we would have passed this cow with the results of the first four antigens used, as we require a complete agglutination in a dilution of 1 to 50 for a reaction. However, the fifth antigen used in testing the blood of this cow was completely agglutinated in a dilution of 1 to 500. This variation is not due to antigens made from strains of *Bact. abortus* (Bang) which have been recently isolated, as compared with those which were isolated a number of years ago. For example, the blood serum of the only cow tested in herd 24 agglutinated one of the antigens in a dilution of less than 1 to 20; with another antigen it gave a complete agglutination with a dilution of 1 to 20 and 90 per cent agglutination with the same antigen in a dilution of 1 to 50. While two antigens, one made from a strain of *Bact. abortus* (Bang) isolated in 1911 and another antigen made from a strain of the organism, isolated in 1926, were agglutinated in a dilution of 1 to 500. Our stock antigen in this case was only partially agglutinated in a dilution of 1 to 20. The stock antigen of course was used in all the tests.

The antigens used for these tests were prepared from agar-slant cultures of *Bact. abortus* (Bang) which had been incubated at 37° C. for 48 hours. These cultures were made from previous 48-hour cultures. After washing the growth from the agar slants with physiological salt solution, into a bottle containing glass beads, it was thoroughly shaken to break up clumps of bacteria that might be held in suspension, and then filtered through three layers of muslin and further diluted until it had a turbidity of 1, according to McFarland's nephelometer (12) scale. One-half of one per cent carbolic acid was added for preservative purposes. The cultures used for antigens were not killed by heat.

Records of the Herds Tested

It was impossible to get the individual records of all the cows of the different herds tested. However, the following records were sent in by the different practitioners at the time blood was shipped to the Experiment Station:

Herd 1—Cow 2 aborted about a month before the test was made. A cow in this herd aborted a year previous to the test and she was disposed of.

Herd 2—Cows 3, 6, 11, 13, 17 and 18 either aborted or had retained afterbirths. Cows 9, 11, 13 and 17 were difficult to get with calf.
Herd 3—The practitioner who sent in samples gave no history of herd.
Herd 4—The practitioner who sent in samples gave no history of herd.
Herd 5—Cow 7 aborted.
Herd 6—Nearly all the cows in this herd aborted.
Herd 7—Blood for this test was drawn by the Extension Veterinarian, Dr. T. P. Polk. Cows 6, 7, 11, 15, 16, 17 and 22 aborted.
Herd 8—No report by practitioner.
Herd 9—Cows 1 and 2 aborted.
Herd 10—Cow 1 aborted. It was not certain whether cow 2 aborted. Cow 3 did not abort.
Herd 11—Four of the cows aborted.
Herd 12—Cows 1, 2, 3, 5, and 6 aborted. Cow 4 was a non-breeder. Blood drawn by Extension Veterinarian, Dr. T. P Polk.
Herd 13—Cows 1 and 2 aborted.
Herd 14—Practitioner's report: "I am sending in samples of aborting cows."
Herd 15—Cow 3 aborted. Dr. T. P. Polk drew the blood for this test.
Herd 16—Cow 4 aborted. Dr. T. P. Polk drew the blood for this test.
Herd 17—Heifers in a herd in which abortion exists. Blood drawn by Dr. T. P. Polk.
Herd 18—Cow 1 aborted last two calves.
Herd 19—Cow 1 aborted.
Herd 20—No history given by practitioner.
Herd 21—No history given by practitioner.
Herd 22—No history given by practitioner.
Herd 23—Cow 1 aborted.
Herd 24—Cow 1. No history given by practitioner.
Herd 25—Cow 1 aborted. Blood drawn by Dr. T. P. Polk.
Herd 26—Cows 4, 6, and 7 aborted. Blood drawn by Dr. Polk.
Herd 27—No report by practitioner.
Herd 28—Practitioner's report: "Abortion exists in this herd."

DISCUSSION

It is seen from table I that there is some variation in the agglutinability of antigens made from different strains of *Bact. abortus* (Bang) when checked against the same sample of serum. This variation in some instances is pronounced. Certain strains of the organism, when tested with the serum of a reacting cow, fail to agglutinate. In testing the serum of a second reacting cow, these strains give a positive agglutination test, while the cultures which reacted with the serum of the first animal fail to give a positive agglutination.

It is plainly evident that a number of the cows tested would have been passed as non-reactors had we used a stock antigen composed of a limited number of strains instead of antigens made of different individual strains of the germ. By requiring a complete agglutination in a dilution of 1 to 50, 47 cows would have been passed by the use of the stock antigen, which cows would have been designated as reactors by the use of antigens made up of other strains of *Bact. abortus* (Bang), some of which were agglutinated in dilution as high as 1 to 500. Similarly,

TABLE I—*Comparative agglutinating properties of different strains of Bact. abortus (Bang)*

HERD No.	No. OF COW	AGGLUTINATION						
		BELOW 1–20	1–20 COMPLETE	PERCENTAGE IN 1–50	1–50 COMPLETE	1–100 COMPLETE	1–200 COMPLETE	1–500 COMPLETE
	1	3	1	90	1			4
	2	1			1		1	2
	3	8			1			
	4	3						1
	5	1	3	90, 70, 70	2	2		1
	6	3	1	85				
	7	3	1	90				
	8	3	1					
	9	3	1					
	10	7	1	70	1			
	11	3				1		
	12	7			3			
	13	3				1		
	14	3	1	50				
	15	6	3	85, 60, 60	1			
	16	4						
	17	3						
	18	3	1	75				
(1)	19	3				1		
	20	3						1
	21	3	1	90				
	22	3	1	60				
	23	3			1			
	24	1				1	2	
	25	3			1			
	26	3	1	40				
	27	5						
	28	2					1	2
	29	5						
	30	2					2	1
	31	3	1	80		1		
	32	2				2		1
	33	3	1	50			1	
	34	4			1			
	35	5						
	36	3	1	75				1
	37	4				1		
	38	1	1	60	1	2		
	1	2	1	90				
	2	2	1	80				
	3	2			1			
	4	2	1	60				
	5	1	1	50		1		
	6	1	1		1			
	7	3						
	8	3						
(2)	9	1			2			
	10	2	1	70				
	11	2			1			
	12	2			1			
	13	1	2	40, 30				
	14	2	1	70				
	15	2			1			
	16	1	1		1			
	17	1	2	80, 0				
	18	2			1			

TABLE I—*Comparative agglutinating properties of different strains of Bact. abortus (Bang)*

HERD No.	No. OF COW	AGGLUTINATION						
		BELOW 1–20	1–20 COMPLETE	PERCENTAGE IN 1–50	1–50 COMPLETE	1–100 COMPLETE	1–200 COMPLETE	1–500 COMPLETE
(3)	1		1	20		1		1
	2	1	2	70, 0				
	3				1		2	
	4		2	70, 0	1			
(4)	1	2	1					
	2	2				1		
	3	2	1					
(5)	1	3	2	50, 90				
	2	2			1			
	3	2	1					
	4	1			2			
	5	1			1		1	
	6	2	1	80				
	7	5	4	80, 40, 90, 80, 70				
	8	2	1					
	9	4	1	90	1			
	10	2	1	90		2		
	11	4	1	80	1			
	12	4	1	60	1			
	13	2				1		
	14	2			1			
	15	2	1	30				
	16	5	1	60				
(6)	1	2					2	
	2	2	1	40		1		
	3	1	1	50		1	1	
	4	4						
	5	1			1			2
	6	3	1	50				
	7	3			1			
	8		1	60		1	1	1
	9	1				1		2
	10	1	1	20		1	1	
	11	4						
	12	4						
	13	2	1	50				2

TABLE I—*Comparative agglutinating properties of different strains of Bact. abortus (Bang)*

HERD NO.	NO. OF COW	AGGLUTINATION						
		BELOW 1–20	1–20 COMPLETE	PERCENTAGE IN 1–50	1–50 COMPLETE	1–100 COMPLETE	1–200 COMPLETE	1–500 COMPLETE
	1	2	2	90, 20				
	2		2	50, 0	2			
	3		3	80, 70, 70	5	2	3	6
	4	2	1	80	1			
	5	14	5	70,0, 50,0, 50	1			
	6				1			3
	7		1	90	2		1	
	8	4						
	9	2	12	80,60,90,80,40,70, 80,40,90,40,80,30	3	2	1	
	10					2		2
	11				1	2		1
(7)	12	3				1		
	13	1	1	20	1			
	14		2	70, 90	2			
	15		1	80		1	1	
	16				2	1		1
	17		1	80			1	2
	18		1	75		1		2
	19		2	80, 90	1		1	
	20	2	2	40, 0		1		
	21	11						
	22				1		1	1
	23	1	2	40,50				
	1	5	3	70, 70, 20	1			
(8)	2	2	1	70				
	3	8	1	80				
	4	5	4	80, 30, 20, 90				
	5	13	3	80, 50, 80				
(9)	1				3		1	1
	2		1	90	1			1
	1	2	1	60	1			
(10)	2	2	2	60, 40				
	3	4						
	1				1	1	1	
	2	1	1	30				1
	3	3						
(11)	4					1		2
	5	1				1		1
	6					2	1	
	7	2			1			
	1	7	2	80, 0				
	2	8			1			
	3	7	2	80, 80				
(12)	4	3			3	1	2	
	5	8	1	90				
	6	8			1			
	7	5	1	80	2			

TABLE I—*Comparative agglutinating properties of different strains of Bact. abortus (Bang)*

HERD NO.	NO. OF COW	AGGLUTINATION						
		BELOW 1-20	1-20 COMPLETE	PERCENTAGE IN 1-50	1-50 COMPLETE	1-100 COMPLETE	1-200 COMPLETE	1-500 COMPLETE
(13)	1		2	0, 40				1
	2	1	1	30				1
(14)	1	2						1
	2	1	1	50				1
	3		2	90, 80				1
	4		1	90	1			1
	5	3						
	6	2						1
	7	1			1			1
(15)	1	1	1	60	1			
	2	2	1	30				
	3	1	2	40, 30				
	4	3						
	5	3						
	6	2	1	90				
	7	2	1	30				
	8	3						
	9	3						
	10	3						
	11	3						
	12	2	1	80				
	13	2	1	90				
	14	2			1			
	15	2	1	20				
	16	2	1	50				
	17	1	1	30	1			
(16)	1	3						
	2	1	2	50, 70				
	3	1	2	50, 80				
	4	1	1		1			
(17)	8	6	2	60, 50				
	9	7	1	40				
	10	6	2	50, 60				
	11	5	3	40, 60, 90				
	12	6	2	60, 90				
	13	7	1	0				
(18)	1							2
(19)	1	2			1			
(20)	1	4	2	60, 0				
(21)	1	4	1		1			
(22)	1	2	1	50				
	2	2	1	40				
(23)	1	1	1	70				1

TABLE I—*Comparative agglutination properties of different strains of Bact. abortion (Bang)*

HERD NO.	NO. OF COW	AGGLUTINATION						
		BELOW 1–20	1–20 COMPLETE	PERCENTAGE IN 1–50	1–50 COMPLETE	1–100 COMPLETE	1–200 COMPLETE	1–500 COMPLETE
(24)	1	1	1	90				2
(25)	1	1				2		
(26)	1	3						
	2	3						
	3	3						
	4	2				1		
	5				2	1		
	6	1	1	50				1
	7	2	1	85				
	8	3						
	9	3						
	10	1	2	90, 0				
(27)	1		2	85,75				1
(28)	1	2					1	
	2	1			2			
	3	1			1	1		
	4	2			1			
	5	2	1	70				
	6	1	1	70	1			
	7	1			1	1		
	8	2			1			

37 cows would have been passed by requiring a complete agglutination in a dilution of 1 to 20, with considerable agglutination in a dilution of 1 to 50 when the stock antigen was used and which were positive in reaction to antigens made from other strains of the germ. In the routine testing of cows for infectious abortion at this Station, we now use at least three antigens made up of different strains of *Bact. abortus* (Bang).

It appears that the differences observed in the agglutination tests in this work may be because the strains differ in their agglutinative characters, sub-types being present within the group. The reaction of the serum of an infected animal to various antigens would then depend upon the agglutinative character of the infecting organism. These results emphasize the importance of the typing of antigen strains and the use of strains representative of the various sub-types in the agglutination test.

ACKNOWLEDGMENT

The writers are highly appreciative for helpful suggestions and criticisms in this investigation by the Extension Veterinarian, Dr. T. P. Polk.

DENTAL ANESTHESIA IN THE DOG

By E. R. FRANK, *Department of Surgery and Medicine,*
Division of Veterinary Medicine, Kansas State Agricultural College
Manhattan, Kansas

Anesthesia of the teeth of dogs is accomplished by blocking the infraorbital and mandibular alveolar nerves. The infraorbital nerves are the largest branches of the maxillary nerve. They pass through the infraorbital canal and contribute filaments to the teeth called dental branches. On emergence from the canal they divide into several branches which supply the upper lip and the nose. The mandibular nerve gives off dental branches to the teeth of the lower jaw which are arranged like the corresponding nerves of the upper jaw. It also gives off branches to the lower jaw.

FIG. 1. Needle in proper position for blocking the infraorbital nerve.

The instruments of choice are a glass hypodermic syringe which is easy to sterilize and convenient to handle, and a 20-gauge needle, two inches long.

Procaine has been the preferred anesthetic, because it is constant in action and is comparatively non-toxic.

To block the infraorbital nerve, select a point about one and one-half inches below the lateral canthus of the eye, in the space between the posterior border of the malar bone and the anterior border of the coronoid process of the mandible.

The field should be shaved and disinfected and an insensitive wheal made in the skin at the point of insertion of the needle. The needle is inserted vertically through the skin and pushed

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through the soft tissues in the space between the anterior border of the coronoid process of the mandible and the malar bone, until its point has passed the edge of the latter. It is then directed forward along an imaginary line that would reach the gingival margin of the upper incisor teeth, until the point of the needle reaches the maxillary foramen, where the nerve is lodged and the injection is to be made. This is at a depth of approximately one to one and one-half inches from the surface, in a dog of average size. Inject two cubic centimeters of a two per cent procaine solution. Incline the dog's head downward, so the solution will remain around the nerve. Anesthesia should be complete in ten minutes and last for approximately twenty minutes.

FIG. 2. Needle in proper position for blocking the mandibular alveolar nerve.

The blocking of the mandibular alveolar nerve is relatively simple. Pass the finger along the lower border of the mandible, from front to back, to where there is a depression. The point at which to insert the needle is at the lowest point of the depression. Insert the needle directly upward, close to the medial surface of the mandible, for a distance of one-half to three-quarters of an inch and inject two cubic centimeters of a two per cent procaine solution. Anesthesia will take place as described for the infraorbital nerve. The only clinical use of dental anesthesia so far has been the splitting and extraction of teeth in cases of dental fistula.

LIVE STOCK IN THE PUNJAB, INDIA, IMPROVED BY CASTRATION CAMPAIGN

Veterinarians Plan Removal of a Million Inferior Bulls from Service—Sires of Good Type Being Distributed

By D. S. Burch, *Editor,*

Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

The extensive castration of inferior bulls is proving to be an effective method of live stock improvement in India, according to an official report on the work of the Punjab Veterinary College, Civil Veterinary Department, Punjab, and the Government Cattle Farm at Hissar. The report covers the fiscal year 1926-27.

India Contains Most Cattle of Any Country

Especially noteworthy is the important part which veterinarians are playing in the problem of live stock improvement. It is noteworthy that India contains more cattle than any other country in the world. the latest estimate (including buffaloes) being approximately 182 million head. This number is about three times the cattle population of the United States and almost half the total number (376 million) in the entire world.

Cattle are of great economic importance to the people of India. The bullock is still the principal motive power in the field, and milk products are a prime food necessity.

Veterinary College at Lahore

The Punjab district, in the northwestern part of British India, is one of the most progressive, agriculturally, there being 31 societies for the breeding of cattle and several additional ones for other live stock. A veterinary college has been maintained at Lahore since 1882 and is now one of the best equipped institutions of its kind in the East. Under its control are more than 200 hospitals in various parts of the Province, at which nearly a million animals annually have received treatment in recent years.

"Perhaps the most important task before the Department," the report of the Punjab authorities states in introducing the subject, "and one that may prove of immense potential advantage to the farmer, is the improvement of the breed of draught and

milch cattle." The method by which the veterinary forces are bringing about the establishment of better and more profitable types is the extensive castration of inferior sires. Beginning in 1913, under the direction of the Civil Veterinary Department, Punjab, the number of castrations has increased from about 15,000 to 218,000 annually. Most of this increase has occurred since 1921.

"The castration of inferior stock continues to gain steadily in popularity," the report continues. "The total number of animals castrated by the staff of the Department, both in hospitals and on tour, was 218,384, an increase of 19.3 per cent on last year's figure and 450 per cent on that of five years ago. . . . . It is noteworthy that during the last year 65 per cent of the total castrations of inferior stock in India were carried out in the Punjab alone. This speaks well for the future of the cattle of the Province."

In addition to the work of the veterinary organization, there were in operation in the Province, as already stated, 31 cooperative societies which foster cattle-breeding. The report gives additional details concerning the progress of the work in 29 districts. Although castration of bovine animals predominated, the same method of improvement is used to some extent for horses and other stock.

Fewer and Better Bulls Needed

The Director of Agriculture, Punjab, estimates that British India contains 1,120,000 bulls, most of which are unfit for breeding purposes, and that 225,000 selected bulls would be sufficient for the requirements of the country.

The veterinary staff of the Civil Veterinary Department consists of approximately 28 veterinary inspectors and 259 veterinary assistants. The influence of the work which is being conducted is evident from the extensive tours made by the inspectors and assistants. During the last year they visited 23,457 villages out of a total of 36,142. Of the castrations made, approximately 104,000, or hearly half, were performed at district hospitals, which number 219. The remaining castrations, numbering more than 114,000, were performed on tour. Arrangements have been made for the opening of 20 more hospitals during the fiscal year 1927-28.

The success of the campaign to castrate inferior bulls in British India is evident from the large scale in which the work is now

being conducted. Simultaneously, the number of breeding bulls under the supervision of the Civil Veterinary Department in the Punjab has increased from about 635, in 1913, to nearly 2,500, in the fiscal year 1926-27. The Punjab Veterinary College is the principal source of veterinarians, but it has been unable to supply a sufficient number of graduates to meet the expanding needs of the Civil Veterinary Department.

Government Cattle Farm Supplies Bulls

The government cattle-breeding farm at Hissar is about 41,000 acres in extent, and is one of the principal sources of improved bulls, for which there is an increasing demand. In addition to large demands from district boards in the Punjab, the report states, there were calls during the year for bulls from Native States and from other provinces in India. The farm succeeded in supplying 354 stud bulls and in addition 82 heifers during the year.

Even allowing for a wide difference in conditions between those prevailing in India and the United States, the report suggests the opportunity for veterinarians in this country and any country to become more influential and active in live stock improvement work. In India, where cattle are considered sacred and where there is opposition to the removal of inferior animals by slaughter, the castration method is especially suitable. However, it is equally applicable in the United States as a means of stopping production of inferior types of live stock, thus leaving a wider field for well-bred animals of high value for breeding and utility purposes. Both live stock owners and veterinarians have a common interest in improved live stock. The former find well-bred, profitable animals necessary in order to yield a return on present high costs of production. Valuable animals obviously justify the expense of veterinary treatment more often than do inferior types of stock.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

PLANS FOR MINNEAPOLIS

The place: Minneapolis, Minnesota.
The time: August 7-8-9-10, 1928.
Headquarters: New Nicollet Hotel.
Official route: Burlington-Great Northern.

MUNICIPAL MEAT INSPECTION

By LESTER C. NEER

Division of Health, Dayton, Ohio

A conservative estimate of the number of veterinarians employed as whole- or part-time meat inspectors by municipalities throughout the United States would place the figure at no less than 500. The larger cities employ meat inspectors on a full-time salary basis to conduct antemortem and postmortem examinations at the many municipal packing-plants, in much the same manner in which the work is carried on in the larger packing-houses by the veterinarians in the employ of the Bureau of Animal Industry. Some of the smaller cities, because of insufficient appropriations, find it necessary to employ their local veterinary practitioners on a part-time basis, at so much per month, or by the payment of a stipulated amount per head, for the live stock slaughtered. The smallest city, to the writer's knowledge, that has ordained that all meat sold within its limits shall be inspected, has a population of approximately 5000.

Of the three cities, namely, Dayton, Ohio, Detroit, Michigan and Atlanta, Georgia, in which the author of this article has obtained his meat inspection experience, the last-named city has, by far, the most ideal arrangement controlling the inspection. All dressed meat offered for sale within the corporate limits of the city of Atlanta must have come from the Atlanta Butchers Municipal Abattoir or from a packing-plant enjoying government inspection. This arrangement centralizes the killing and greatly reduced the number of veterinarians necessary to facilitate the inspection.

Of the many problems confronting those interested in municipal meat inspection, the handling of the country "frost butcher" is indeed a difficult one. Butchering several times a season and located in widely separated parts of the country, these pork butchers present a none too easily solved problem if their meat is to be efficiently inspected by the limited facilities for doing so, which most cities have. Another problem is that of permitting the smaller slaughter-houses to kill during the absence of the inspector. Lack of sufficient help often makes this necessary.

Comparing the plants of packers which have government inspection with those of the smaller packers, we find that the plants of the latter are not so well constructed or equipped. This condition makes it impossible to enforce the rigid sanitary requirements as to arrangement, methods, etc., to which the big packers must conform.

The value of city meat inspection should not be estimated solely in terms of animals condemned, as the very fact of its existence prevents a municipality from becoming a dumping-ground for unwholesome meat, from diseased, crippled and cold-slaughtered animals.

VETERINARY LICENSE REVOKED

On April 24, 1928, Commissioner Herbert E. Powell, of the Michigan Department of Agriculture, signed an order revoking the license of Karey E. Rogers, of Ravenna, Mich., a registered, non-graduate practitioner. Action in this case was based on that portion of Section 15 of the Veterinary Practice Act, which specifies "that the license of any person claiming the right to practice veterinary medicine, surgery or dentistry may be revoked upon satisfactory proof that such person is incompetent, by reason of his habits or otherwise, to practice the profession. Any such licensee who practices a fraud on the public or upon any person by claiming to be able to cure an incurable disease of animals shall be deemed to be incompetent to practice the profession within the meaning of this Section."

It was contended and demonstrated that Rogers advertised an ability to cure abortion disease in cattle and that he was further guilty of fraud in purchasing animals which he claimed were affected with the disease for ridiculously low prices. It is believed that this is the first time that a successful action has been brought to revoke the license of a veterinarian in the state of Michigan.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

AN UNUSUAL CASE OF VENTRAL HERNIA IN A PHILIPPINE DOG

By LOPE M. YUTUC, *Los Banos, P. I.*

College of Veterinary Science, University of the Philippines

The object of this paper is to report an unusual case of ventral hernia in a Philippine dog. A survey of the literature available shows no description of a clinical case of this condition. In view of this, the recording of the case in question appears justifiable.

The animal was brought to the attention of the writer in Manila, while he was employed as assistant clinician in the Merchant-Turla Veterinary Hospital.

The history of the case ran as follows: On May 7, 1927, at about 4:00 o'clock in the afternoon, an American woman came to the hospital with a native male puppy about three months old. She stated that about three hours before, as she was leaving her residence in a motor vehicle, a cry was heard; she stopped the machine and looked around. To her surprise she found her pet dog had been injured by the motor-car. The animal was running beside the wall in a crouching manner and on inspection a swelling was noted inside the thigh. A cold pack was applied but no improvement was apparent, though the animal appeared normal otherwise. The woman claimed that one of two things must have happened—the animal had been caught by some under part of the moving vehicle or had been bumped by the mud-guard.

The temperature of the animal at the time of the examination was 39° C., and the pulse rather accelerated. The swelling was circumscribed with a bluish tint and located inside of the left thigh (fig. 1). It was as large as an ordinary-sized mango and flattened sagittally. The shape varied, changing as the position was shifted. With the animal standing squarely on all four legs, the enlargement extended approximately from the inguinal region to about 2 cm. above the stifle joint. Posteriorly, its widest diameter reached to a point about 2.5 cm. from the

posterior margin of the semitendinosus, and anteriorly it went beyond the anterior border of the sartorius by about 2 cm. On palpation it was found to be soft and slightly warm; elastic and tubular coils were noted internally. The content was apparently returned into the abdominal cavity by careful manipulation. Pain was slight and evident only when the abdominal rent was palpated. The animal, when running, demonstrated a straddling gait.

This case may be easily confused with femoral hernia, a condition characterized by the protrusion of a portion of the viscera through the femoral canal beneath the subcutis, forming a well-

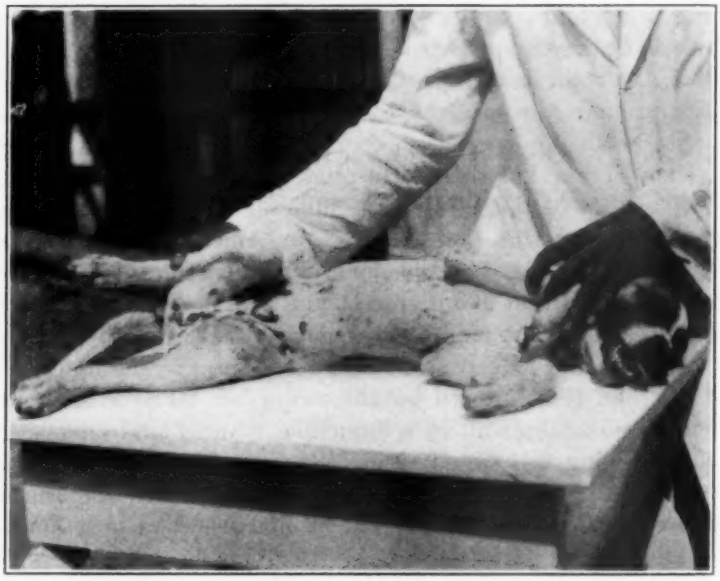

FIG. 1. Ventral hernia in a dog.

defined enlargement in the inner aspect of the thigh. The occurrence of this form of hernia in domesticated animals is denied by some observers. To support this view, Dollar[1] cites Moller and others. Hobday[2] states that it merits only a passing mention. On the other hand, Liautard[3] cites Lafosse, Jr., as having observed it in the horse; Girard, Jr., in the dog; Dandrieu, in cows; and Hertwig, in horses, donkeys and dogs.

Incidentally, the condition discussed by these writers presented almost the same clinical manifestations as in the case of the animal under discussion. Hence, femoral hernia was

given as a probable diagnosis. The contradictory opinion of several authorities about the occurrence of this form of hernia and the rather large ring as determined in the examination led the writer to withhold conclusions and a definite diagnosis until further development of the case.

The treatment was purely surgical. Palliative treatment was first tried. This consisted of the replacement of the viscera into the abdominal cavity and when reduction was completed a tampon of cotton was placed on the affected part and retained by proper bandaging. By the following day both the tampon and the bandage were torn into pieces. This procedure was repeated, then was pronounced impractical. It was then decided to perform herniotomy.

On May 12, the animal was operated on. Morphin sulphate was given under the skin as a hypnotic and Waite's local anesthetic was injected at the field of operation. Preliminary precautions regarding aseptic surgery were closely observed.

An incision about 7 cm. long was made through the skin over the hernia. Care was taken not to injure the content or the blood-vessels supplying the region. When the content was exposed, it was found to be loops of intestines and a portion of the omentum. The intestines and the omentum were returned into the abdominal cavity. The omentum was adherent in several places to the pouch and also to the ring. It was detached with ease with the fingers and returned. The hernial ring was about 5 cm. at its widest diameter. Small pin-point hemorrhages were noted scattered on the ring. An accumulation of fatty cellular material was also noted at the opening. The ring formed by the ruptured ends of the internal oblique abdominal muscle was located about a centimeter from the shaft of the ileum.

The sac was made up of the skin and the subcutis medially, and laterally of the facia and the inner muscles of the thigh. The femoral vessels located in this region were not exposed but could be seen pulsating.

The ring was approximated with continuous, and the surgical incision with interrupted, sutures. A cotton pack saturated with an antiseptic solution was applied over the operated area and retained by a many-tailed bandage. After four days, the sutures were removed and the animal made a rapid recovery.

French[4] defines ventral hernia as a condition which comprises all hernias arising through a subcutaneous rupture of the abdominal muscles. With reference to its location, Merillat[5] claims

that the region of the groin is one of the possible locations in the horse. Then the case described may fall under this group.

The illustration of the groin location of ventral hernia in the mule, given by Merillat, presents an entirely different topographical picture from the case here discussed. The viscera apparently went on a different course, forming a bag located approximately on the latero-ventral aspect of the abdomen, almost in front of the stifle joint, while in the case in question it remained inside the thigh. This difference and its close resemblance to femoral hernia made the condition unusual and of value to those interested in surgical diseases. Further, the data supplied by this case may constitute additional information to our knowledge of ventral hernia.

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[2]Hobday, F. T. G.: Surgical Diseases of the Dog and Cat (2nd ed.; Bailliere, Tindall and Cox, London, 1906), pp. 366.
[3]Liautard, A.: A Manual of Operative Veterinary Surgery (William R. Jenkins, New York, 1906), pp. xxix + 803.
[4]French, Cecil: Surgical Diseases and Surgery of the Dog (Alexander Eger, Chicago, 1923), pp. xiii + 408.
[5]Merillat, L. A.: Veterinary Surgical Operations (2nd ed.; Alexander Eger, Chicago, 1918), pp. 556.

CYST ATTACHED TO DORSAL SURFACE OF UTERUS

By J. F. SHIGLEY, *State College, Pa.*

The data for this case report were obtained from our observation of a registered Berkshire sow. This animal had previously farrowed three good litters and showed the usual external sign of pregnancy, that is, an increase in the size of the abdomen. As a record of breeding was kept, the sow was brought to the farrowing-house a few days before the date of farrowing. No increase in size of the mammary glands or vulva was evident. On the date when the period of pregnancy might have terminated, the sow was uneasy, irritable, and showed signs of labor. These symptoms lasted about twenty-four hours, during which time an examination was made and the abdomen palpated to determine the condition of its content.

The right side of the abdomen was pliable and only slightly distended. The left side was firm and much larger than the right.

At the end of one week, the sow was again turned out in the exercise-lot. The appetite during this period was variable. It was thought advisable to slaughter the sow and this was done

about two weeks after the period when farrowing would normally have occurred.

On opening the abdomen a large sac was noted that, at first glance, gave one the impression of a horn of the uterus. Examination showed, however, that this sac was attached to the dorsal surface of the uterus at the bifurcation of the horns and was suspended between the horns. The latter as well as the ovaries appeared normal.

The sac or cyst was opened and about twenty quarts of liquid were released. This liquid was straw-colored, cloudy, and had a bad odor. The wall of the sac was relatively thick and had considerable coagulated serum over its surface. No bacterial or other pathological examination was made.

The symptoms of approaching parturition exhibited by this sow under conditions revealed by the postmortem were of sufficient interest to the writer to stimulate a record of the case.

FEBRE APHTOSA (FOOT-AND-MOUTH DISEASE) IN BRAZIL

A Few of the Characteristics of the Disease as Noted in a Recent Infection Among Animals Belonging to the Escola Agricola de Lavras

By G. A. Roberts, *Lavras, Minas, Brazil*

This school is the Agricultural School of the Presbyterian Evangelical Institute at Lavras, Minas, Brazil, the other schools being Collegio Kemper (school for girls) and the Gymnasio de Lavras (high school). This is one of the few agricultural mission schools.

The infection of foot-and-mouth disease exists permanently in Brazil but as a rule does not remain long in any one locality. It may visit the same neighborhood every year or it may skip one or several years, much like hog cholera in the States. (Hog cholera does not exist in Brazil.)

The disease appeared among our herds in both 1923 and 1924, then returned early in 1928. Some years it appears very light and in others quite severe.

This year our herd bull (imported Holstein), sheep and swine had access to the same pasture and after the disease once put in its appearance here, all animals were soon affected. The disease had been round about us for two months or more and we began

to hope it might pass us by, even though the infection is more insidious than that of hog cholera. As a matter of fact, our dairy herd, consisting of 12 cows with 10 calves, only a quarter of a mile away from the other animals, did escape, with the exception of one heifer. She was removed upon showing the first symptoms and put with the affected animals, where she made a rapid recovery without treatment of any kind. Our eight work oxen, kept considerably further away, likewise escaped. Our horses and mules being immune or non-susceptible, mingled freely with the affected animals, and of course showed no evidence of disease. It has now been some six weeks since hearing of any new cases in the vicinity and the disease has most likely disappeared for this year.

FIG. 1. Shote showing sloughing of hoofs, following foot-and-mouth disease.

THE DISEASE AMONG SHEEP

Since sheep in general seem to be more or less refractory to this infection, there were no severe cases. None of them showed any visible mouth lesions but because of sore feet they remained lying down most of the time for from one to two weeks, and, hence, grazed very little but ate what was put before them. No treatment was given and they all made complete recoveries.

THE DISEASE AMONG HOGS

The hogs showed varying degrees of mouth lesions but missed very few meals. However, the foot lesions in many were quite

severe and, as very frequently happens, secondary infections caused sloughing of the hoofs in a number of cases. Figure 1 shows three hoofs sloughing and the shote is barely able to remain on them, braced against the walls of her pen. All but this one have recovered in six weeks. There were no small pigs, where losses are always heavy. Two sows were fairly well advanced in pregnancy and both aborted their litters of eight each.

The Disease Among Cattle

The Holstein bull (fig. 2) had well-marked mouth lesions and slobbered freely for a week. He was also very tender-footed for

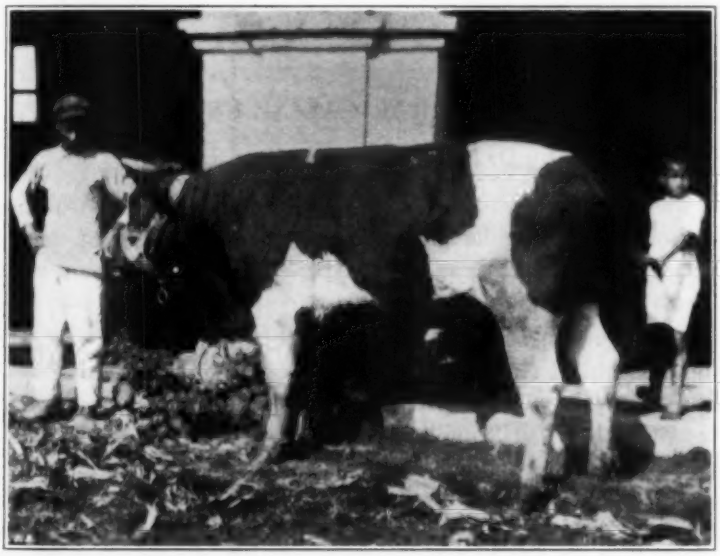


Fig. 2. Holstein bull following recovery from foot-and-mouth disease.

a couple of weeks but remained standing much of the time during the day. He lost some flesh but remained in fairly good condition. He, as well as the worst cases among the hogs, were given local treatments with trypaflavine solution (1 per cent).

As is well known, few adult animals die from foot-and-mouth disease, but aside from the loss of flesh and temporary use of animals, there are other losses, both from the original infection and secondary infections among cattle. We are convinced in our own mind that the reason for the lack of heavy milkers in this country (in eight years I have not seen nor heard of a case of "milk fever") is that the imported, or home-raised, heavy

milker, permanently loses her capacity to give a large milk-flow after her first attack of this disease; and she does not remain here many years before getting her first infection.

Many dairymen have ceased attempting to improve their herds and milk supply because of this factor. We are not overlooking the factors of improper feed and care. The result of the secondary infections is more commonly observed among beef animals perhaps, because of their greater number, and being given less care. Such infections frequently result in sloughing of the hoof or more commonly the development of a soft tumorous growth between the claws, called "frieira," causing difficulty in or impossibility of "navigating on dry land."

URETHRAL CALCULUS*

By O. N. SCHULTZ, *Latimer, Iowa*

I was informed by telephone that "the water was bothering" this horse; thinking he had one of the usual forms of colic, I came so prepared and traveled light, as the roads were next to impassable.

The patient was a large grey gelding, about 12 years old, and although thin at the time, he looked to have been in good flesh. The horse presented a picture of distress and made frequent attempts at micturition, but only a few drops were passed at each attempt. The owner informed me that this condition was of about 48 hours standing. The patient had made attempts, as now shown, during that time. At first the horse would eat and drink and also had normal bowel movements, but all this had stopped. Rectal examination revealed a highly distended bladder which filled the entire pelvic inlet, anterior to which the rectum was impacted with dry feces. A soft rubber catheter was inserted but it could be passed only to somewhere in the neighborhood of the ischial arch. A diagnosis of urethral calculus was made, the location of which was in the region of the ischial arch. However, I could not palpate the calculus externally, because the horse was quite fat.

It was considered unwise to cast the animal for an operation, fearing the bladder might rupture during the struggle. The animal was of a docile type, so we merely tied it quite securely

*Presented at the fortieth annual meeting of the Iowa Veterinary Medical Association, Des Moines, January 17-19, 1928.

against the side wall and a nose-twitch was applied. The tail was tied forward. My post for operating was a deep manger, which served jointly as a place for safety and a convenient table for instruments. The skin immediately below the anus was infiltrated with a local anesthetic for about three or four inches. This anesthesia was carried down as the tissues were divided. The urethra proved very difficult to incise. It required a very sharp scalpel to make the incision. This done, the urine gushed out, which indicated that the calculus was below the incision. The incision was carried down far enough to admit a finger readily and the obstruction was found about three inches below the incision. This, however, was not extended downward, as it would have made too large an opening in the urethra, which would be hard to heal and cause a leakage of urine into the tissues. The calculus was of the dimensions of a walnut, about an inch in diameter, was very rough and the wall of the urethra was tightly wrapped about the stone, making extraction difficult. The horse did not take well to the necessary traction.

A complete chlorofrom anesthesia would be indicated, both to quiet the animal and also to cause a relaxation, but as I had none with me, further attempts were made. With the aid of a strong rat-tooth compression forceps and by repeatedly nicking the circumference of the stone, I succeeded in dividing it in halves, after which the parts were quite readily extracted.

The incision of skin and connective tissue external to the urethra was carried down so as to allow good drainage, especially should urine leak out through the incision of the urethra. The opening was quite tightly packed with a "bip" pack, and sutured in place with interrupted sutures. This pack was left in place 36 hours and removed after taking out the two lower stitches. The case was not seen again but instructions left to paint the stitches with healing oil and, when they pulled, paint the interior. This, however, was not necessary, as the skin incision healed by first intention and no leakage of urine ever took place as was really expected to happen.

The owner informed me later that the horse was as good as ever although it had to stop to urinate, which, to my mind, was no doubt caused by a lax sphincter muscle of the bladder, due to over-extension.

REVIEWS

BLACK'S VETERINARY CYCLOPEDIA. Edited by William C. Miller, M. R. C. V. S. et al. viii+1081 pages, with 326 text figures and 8 full-page half-tone illustrations. MacMillan Company, New York, and A. & C. Black, Ltd., London, 1928. Cloth, 21 sh.

Undoubtedly there must have been some demand for a book of this kind or it would not have been written. Whether it will serve any really useful purpose is seriously open to question. At first glance it appeared to be only another book for lay consumption, but a reading of the preface reveals the fact that the producers had in mind that this volume, on occasion, might be of some use to the veterinary student and even the practitioner. Clearly it has been designed for consumption by a mixed group of potential purchasers. Whether the layman will find the reading matter "over his head" or whether the veterinarian will find the contents of the book too elementary will lie with him who tries to get his money's worth out of his purchase.

About the only redeeming feature of this book is that it appears to have been written by recognized authorities. It is much better to have a book of this kind written by those who are qualified than it is to entrust such a difficult task to those who are incompetent.

To any who might want to have, within the confines of a single volume, a digest of veterinary anatomy, physiology, materia medica and therapeutics, surgery, medicine, obstetrics, diagnosis, pathology, bacteriology, serum therapy, or what have you, here is a book admirably adapted for the purpose. Or to any who might merely want a handy reference to the composition of a Seidlitz powder, or a semi-technical definition for anaphylaxis, we tenderly entrust this volume.

Minneapolis, City of Lakes and Gardens

THE BOSTON TERRIER. Vincent G. Perry. 153 pages, with numerous illustrations in the text. Judy Publishing Co., Chicago, 1928. Cloth, $2.00.

The author is a noted international judge, as well as a breeder, of Boston terriers, frequently referred to in dogdom as the one distinctively American breed of dogs. The author's enthusiasm

bursts forth in his introduction to the book. He says: " . . . they tried to say that the Boston terrier was not a breed, he would not last, he could not breed true to type, he was just a fad. There he stands to take his bow, an aristocrat among the aristocrats, as fine a piece of dog flesh as was ever created by the scientific methods of dog breeding—a pure-bred of the bluest blood, a dog that will breed true to type, a dog which, matched merit for merit, can take his place with any of the many breeds of dogs in the world."

The book contains chapters on the origin and history of the breed, strains, breeding, whelping, kenneling, feeding, training, exhibiting and handling, standards, registering, etc. In discussing the treatment of distemper the author states that "a handful of dry table salt forced down a dog's throat will rid him of a great deal of the poison in his system and sometimes effect a quick recovery if done soon enough." Further on it is stated that "raw onion poultices under his throat will clear his head." Interesting, if true.

Among the therapeutic agents mentioned in connection with the treatment of distemper are "liquid peptinoids" and "argerol." After concluding the treatment of distemper, the author advises readers "to consult a veterinarian for any and all ailments, or in the event of not having a dog specialist veterinarian near at hand, to equip themselves with a book dealing entirely with kennel diseases."

The author's views on cropping are commendable. He is not against legislation forbidding cropping. He says: "If cropped ears do not make the dog, then certainly, natural ears will not mar him."

Minneapolis, City of Sky Blue Waters

ABSTRACT

THE DEVELOPMENT OF A TOXEMIC CONDITION IN THE DOG DURING GESTATION. William deB. MacNider. Jour. Amer. Med. Asso., lxxxx (1928), 2, pp. 71-75.

Observations were made on 121 pregnant dogs of varying ages, some of which showed renal changes before or shortly after the beginning of pregnancy. Catheterized urine was examined for albumin, dextrose and diacetic acid, while centrifugalized specimens were studied for casts. Phenol-sulphon-

phthalein tests were made for renal function. Blood urea and reserve alkali determinations as well as those for non-protein nitrogen and creatinine also were made.

Summarizing the results of his observations and tests, the author concludes that conditions looked on as some type of toxemia of pregnancy are of infrequent occurrence but may develop in the dog. In normal pregnant animals there is a definite tendency for the acid-base equilibrium of the blood to become disturbed. This disturbance is more apt to occur in old animals and is more marked in the latter weeks of the gestation period. The cause for this change is unknown. The frequency of its occurrence woud tend to support the suggestion of Wilson and others of the value of a solution of sodium bicarbonate, with or without dextrose, during certain departures from normal which may develop during gestation.

Retention of blood urea, non-protein nitrogen and creatinine are dependable indices of renal impairment.

If the renal injury which has developed prior to pregnancy is largely glomerular in character and is associated with altered epithelium in the tubules, the acute changes in the tubules occurring with the development of certain toxemic conditions during gestation prevent a second epithelial regeneration and these animals fail to return toward normal.

S. S.

Minneapolis, the Metropolis of the Northwest

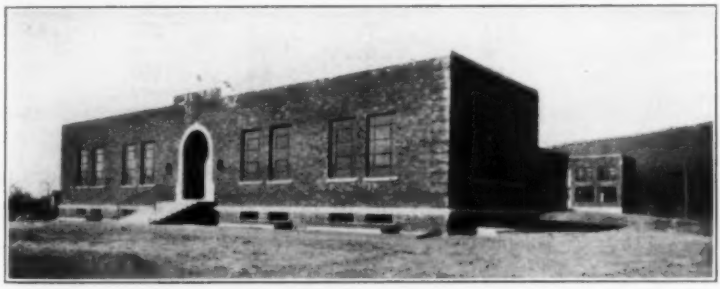
Business Section of Minneapolis

MISCELLANEOUS

PENNSYLVANIA BUREAU OF ANIMAL INDUSTRY LABORATORIES NOW LOCATED NEAR HARRISBURG

After the sale, in 1919, of the Pennsylvania Bureau of Animal Industry Farm, which was located in Delaware County, ten miles from Philadelphia, the need of an animal and poultry disease experiment farm, to be operated in conjunction with the Diagnostic and Research Laboratories, had been forcefully demonstrated by the frequent demands requiring the facilities of such a farm.

The Bureau's laboratory was located in Philadelphia, 100 miles from the administrative office in Harrisburg. This was the cause of considerable inconvenience in conducting work of the Bureau as a whole and had a tendency to cause considerable reduction in



General laboratory building.

efficiency. Besides the inconvenience caused by this arrangement, the work of the laboratory had overgrown the amount of available space in its Philadelphia location.

To overcome these handicaps and lack of facilities, a conveniently located farm was selected, having a suitable location for the diagnostic and research laboratories, properly surrounded, and having slope of ground and drainage which makes it an ideal location for conducting experimental work on animal diseases. This farm, containing eighty acres and situated along the west side of the Susquehanna River, six miles north of Harrisburg, was purchased during the year 1923.

Plans were drawn for the new laboratory building and bids were obtained for its erection. On account of shortage in funds,

it was decided to build and equip only the rear part of the building, which would supply the required needs at first, and complete the building after more funds were available.

The entire building has now been erected but the front part has not yet been occupied, although about the middle part of December, 1927, the laboratory equipment was moved from the Philadelphia laboratory into the rear part of the new building.

The new laboratory building offers much more room for expansion and has been operating, under some minor handicaps expected in a new building, since December 19, 1927. There was only a slight halt in the work which could be attributed to the moving.

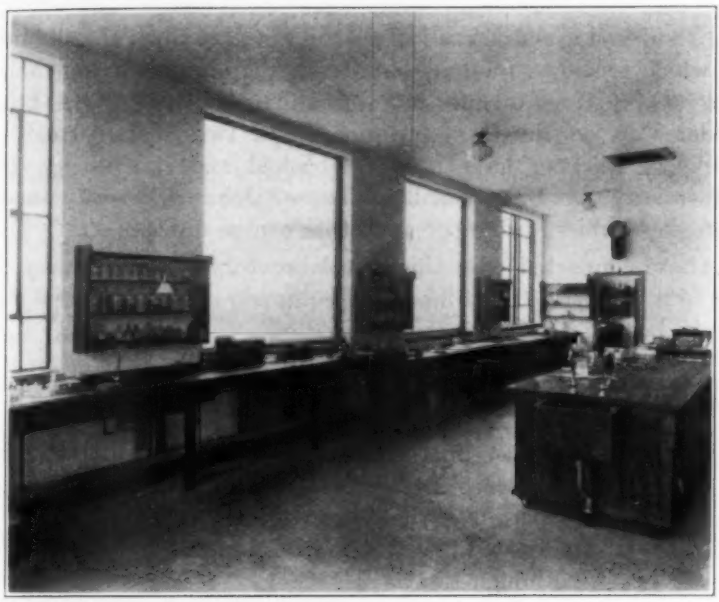
During the four months from December 1, 1927, to April 1, 1928, diagnoses were rendered on the variety of animals shown in the following table:

	December	January	February	March	Total
Cattle	1732	1814	2058	2751	8355
Horses	133	7	8	288	436
Swine	6	6	16	8	36
Sheep	83	92	89	190	454
Deer	2	1	0	7	10
Dogs	41	63	79	68	251
Cats	3	0	1	4	8
Foxes	0	0	0	9	9
Chickens	4554	2775	3858	1604	12791
Miscellaneous	9	3	9	12	33
Totals	6563	4761	6118	4941	22383

The large number of cattle and chicken diagnoses is accounted for by examinations for Bang bacillus and pullorum diseases, respectively. The miscellaneous group included diagnoses on mules, humans, rabbits, guinea pigs, squirrels, minks, canaries, turkeys, geese, ducks and grouse.

The laboratory building is arranged in the form of the letter "T." The front part, which corresponds to the top of the "T," contains three offices, two private laboratory work-rooms, the library and museum combined, a toilet, a chemical room, lobby and corridor, on the first floor; and a corridor, dark room, large stockroom and large work-room in the basement.

The rear part of the building, corresponding to the stem of the "T," contains the main diagnostic and routine laboratory, four good-sized laboratory work-rooms, postmortem room, wash-room, culture media and sterilizing room, inoculating room, small packing-room, toilet, two built-in electric incubators,



Main laboratory.

built-in refrigerator and a large corridor with twenty built-in metal lockers on the first floor; and a wide corridor, packing-room, boiler-room, electric switch-board, coal-bins, refrigerator machine, incinerator and toilet in the basement.

To the rear of the laboratory is a two-story small-animal house, containing a basement for root-storage purposes. There are approximately twenty inexpensive buildings for housing animals used for experimental purposes, situated over the farm.

Flock of merino sheep used for experimental purposes.

In addition to the diagnostic work in the laboratory, the amount of which is shown for four months in the accompanying table, several experimental projects on animal diseases have been under way on the farm for more than two years. Healthy flocks of chickens have been established and experiments are under way on Bang bacillus disease, Johne's disease, sheep parasites, rabies, distemper and other canine diseases.

Those connected with this new laboratory aim eventually to make it one of the most modernly equipped laboratories and one of the best of its kind in the country.

JUST A DOG

Oh it may seem strange but I never tire
Of lying before the bright, open fire,
Receiving kind strokes from the gentle hands
Of my lovely master, who understands
Although I am—just a dog.

Sometimes he whistles, he laughs and is glad,
Then again he seems downhearted and sad;
I wish I had the power of voice to say
The words my full heart so longs to convey
Although I am—just a dog.

There are many who love him, this I know,
For into his life they come and they go,
But there can be none as faithful as I
And, I shall worship him until I die
Although I am—just a dog.

When I gaze into his soft, love-lit eyes,
His soul is reflected as godly-wise;
And since it is his hand that cares for me
I must believe in a kind deity,
Although I am—just a dog.

Oh, I would not desert him for one day,
And his own cheery call I shall obey,
Until that hour when I am cold and dead,
And this simple marker stands at my head:
"Faithful Pal" or,—"Just a Dog."

MRS. THERESSA DEFOSSET.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Regular Army

Captain Paul R. King is relieved from assignment and duty at the quartermaster intermediate depot, Fort Robinson, Nebraska, and assigned to Fort Robinson.

The promotion of Lt. Colonel John A. McKinnon to the grade of colonel, effective March 28, 1928, is announced.

Captain John W. Miner is relieved from duty at the quartermaster intermediate depot, Front Royal, Va., effective July 15, 1928, and is assigned to Fort Leavenworth, Ks.

Captain Floyd C. Sager is directed to report to the Commanding Officer quartermaster intermediate depot, Front Royal, Va., for duty upon completion of his present course of instruction at the Medical Field Service School.

Orders directing Major Horace S. Eakins to proceed to Fort Reno, Okla., upon completion of his present tour of foreign service in the Panama Canal Department, have been changed to direct him to report instead at Fort Robinson, Neb.

Second Lieutenant Elmer W. Young is relieved from further duty at Fort Huachuca, Arizona, and is assigned to Fort Lewis, Wash.

Reserve Corps

New Acceptances

Lenheim, Edward H.	Captain	111½ Santa Fe Ave., Burlingame, Ks.
Mersch, Louis D.	2nd Lt.	1322 Walnut St., Cedar Falls, Ia.

Promotions

	To	*Address*
Born, Arthur Leonidas	1st Lt.	Story City, Iowa
Ogilvie, Robert Alexander	1st Lt.	

Separations

Hanneman, W. H.	2nd Lt.	Appointment terminated because of National Guard status.
Romberger, Earl E.	1st Lt.	Declined reappointment.
Trigg, Wm. Stark	1st Lt.	Resigned.
Shaw, Scott N.	2nd Lt.	Failed to accept reappointment.
Corson, Charles	1st Lt.	Failed to accept reappointment.
Kingman, Harry E.	Major.	Appointment terminated.
McKitterick, J. A.	Captain.	Appointment terminated because of National Guard status.

Minneapolis, by the Waters of Minnetonka

BUREAU TRANSFERS

Dr. Charles E. Mootz (Cin. '12), from Wheeling, W. Va., to Duluth, Minn., in charge of meat inspection.

Dr. Stephen H. Hopkins (Chi. '10), from Topeka, Kans., to Omaha, Nebr., on meat inspection.

Dr. Howard J. Foote (Corn. '24), from Albany, N. Y., to New York, N. Y., on meat inspection.

Dr. A. N. Smith (U. P. '07), from New York, N. Y., to Piqua, Ohio, in charge of meat inspection.

COMMENCEMENTS

ONTARIO VETERINARY COLLEGE

The spring examinations of the Ontario Veterinary College, Guelph, Ontario, were completed on April 28, and graduation exercises were held on April 30.

The degree of Bachelor of Veterinary Science was conferred at a special Convocation of the University of Toronto on eighteen graduates as follows: Joseph T. Akins, Wilmer L. Bendix, James C. Carey, Miss E. B. Carpenter, Clyde Dohner, Samuel P. Giebelhous, Charles E. Goodwin, William L. Grubb, Anthony A. Kingscote, John R. Martell, F. Midwinter-Steane, Geoffrey S. Muir, Robert C. Pannell, Edward F. Peck, Percy J. G. Plummer, Harland R. Potter, Harold A. Webb, and Arthur A. White.

Honors were awarded to members of the graduating class as follows:

General Proficiency

First Prize—G. S. Muir, of Toronto, Ontario
H. R. Potter, of Stamford, Ontario
Second Prize—E. F. Peck, of Oyen, Alberta
Third Prize—A. A. Kingscote, of Cowichan, B. C.

Bacteriology

Special Prize—P. J. G. Plummer, of St. Catharines, Ont.

Helen Duncan McGilvray Honorarium

Harland R. Potter, of Stamford, Ontario

K. S. A. C. PRIZES

The fifth annual Recognition Day program of the Kansas State Agricultural College took place in the College Auditorium, May 4, 1928. At this time, all winners of student prizes in the College received their prizes and awards. The names of the winners of the prizes offered the students of the Division of Veterinary Medicine are as follows:

General Proficiency

(Prizes offered by Dr. E. A. Schmoker (K. S. A. C. '17), of Monroe, Wash.)
First Prize ($10.00).....Roy L. McConnell
Second Prize ($ 5.00).....Glen L. Dunlap

Therapeutics

(Prizes offered by the Jensen-Salsbery Laboratories, of Kansas City)
First Prize ($ 7.50).....Karl W. Nieman
Second Prize ($ 7.50).....Lawrence O. Mott

Pathology

(Prize of $7.50 offered by the Veterinary Faculty of the College)
Glen L. Dunlap

Physiology

(Prize of $7.50 offered by the Veterinary Faculty of the College)
Thos. J. Leasure

ASSOCIATION MEETINGS

SOUTH DAKOTA VETERINARY MEDICAL ASSOCIATION

The annual meeting of the South Dakota Veterinary Medical Association was held in Sioux Falls, January 25-26, 1928.

The program the first afternoon consisted of taking care of business and electing officers for the coming year. Officers were elected as follows: President, Dr. E. A. Dornbusch, Milbank; vice-president, Dr. H. A. Hartwick, Huron; secretary and treasurer, Dr. Ben Anderson, Canton.

We were also favored during the afternoon by speeches given by Hon. L. N. Crill, Secretary of Agriculture, and Mr. Lawshe, secretary of the Sioux Falls Chamber of Commerce.

In the evening a banquet was held in the ballroom of the Cataract Hotel. Members of the Association, their wives and friends were invited. The occasion was a glorious one.

The second day of the meeting was well taken care of by such men as Dr. J. O. Wilson, of Pierre; Dr. C. N. McBryde, of Ames, Iowa; Dr. M. W. Ray, of Pierre; and Dr. H. E. Biester, of Ames, Iowa. A discussion on poultry was carried on by Drs. C. G. Faber, of Mitchell, and Martin, of Armour.

The register showed about 150 names. Seven new members were added to the roll.

The following resolution endorsing an increase of salaries for all B. A. I. veterinarians was adopted:

WHEREAS, It has come to our attention that an organized effort is being made by the National Association of Bureau of Animal Industry Veterinarians to have the amount allotted by the Director of the Bureau of the Budget, in the Agricultural Appropriations Bill for the fiscal year 1929, for promotions July 1, 1928, to veterinarians employed by the U. S. Bureau of Animal Industry, restored to the original amount of $256,870, as recommended by Dr. John R. Mohler, Chief of the Bureau of Animal Industry, and approved by Hon. Wm. M. Jardine, Secretary of Agriculture, and

WHEREAS, More adequate salaries for this professional group, more nearly commensurate to salaries paid other trained technical and professional workers in governmental employ, are necessary to attract competent veterinarians to this service and provide for reasonable promotions based on increasing efficiency, to the end that the record of service rendered to agriculture and allied interests by the Bureau may be continued on a high plane, and

WHEREAS, The movement for more equitable adjustment of salaries of Bureau veterinarians has been endorsed by the American Veterinary Medical Association as of vital importance to all concerned directly or indirectly in safeguarding the health and soundness of the nation's live stock and food supply, therefore be it

Resolved, By the South Dakota Veterinary Medical Association, in convention assembled, that we give our endorsement to this movement, and pledge our support, through all legitimate means, to the National Association of Bureau of Animal Industry Veterinarians in their efforts to obtain this much needed relief, and be it further

Resolved, That copies of this resolution, duly signed by the president and secretary of our Association, be sent to each member of the South Dakota congressional delegation and the chairmen, respectively, of the Agricultural Appropriations Committees of the Senate and House of Representatives.

The 1929 meeting of the Association will be held at Huron.

BEN ANDERSON, *Secretary.*

Minneapolis, City of Lakes and Gardens

FLORIDA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Florida State Veterinary Medical Association was held in Jacksonville, February 13, 1928, in conjunction with the annual meeting of the Southeastern States Veterinary Medical Association. Officers for the year were elected as follows: President, Dr. Floyd G. Martin, Lakeland; vice-president, Dr. H. W. Willis, Dade City, Fla.; secretary-treasurer, Dr. A. L. Shealy, Gainesville.

Minneapolis, City of Sky Blue Waters

LOUISIANA VETERINARY MEDICAL ASSOCIATION

The 1928 meeting of the Louisiana Veterinary Medical Association, held at Louisiana State University, Baton Rouge, February 15-16, will long be remembered by those who attended. The meeting was called to order by the President, Dr. F. A. Hoell, in the Agricultural Auditorium and the roll-call revealed thirty-seven veterinarians in attendance.

The address of welcome was delivered by Dean W. R. Dodson, of the College of Agriculture. Dr. A. T. Prescott, of Baton Rouge, made the response.

The literary program was opened by Dr. Harry Morris, of Baton Rouge, with a well-prepared paper entitled, "Sterility in Cattle." He explained his method of handling this condition in the dairy herd belonging to the Louisiana State University. A paper by Dr. J. A. Goodwin, of New Iberia, entitled, "Tick Fever in a Herd of Pure-Bred Jerseys," covered in detail his method of treating this disease in a valuable herd which became

infested as a result of having been moved to a new pasture for the purpose of escaping the ravages of last year's flood. This subject brought forth a great deal of discussion, as we are having our troubles with this disease in Louisiana.

Mr. W. R. Perkins, director of extension, Louisiana State University, talked on how the county agent and veterinarian can cooperate for the benefit of the live stock industry. The next subject to be discussed was anaplasmcsis. The disease in its different phases was discussed by Dr. G. Dikmans, Jr., pathologist, Bureau of Animal Industry; Dr. F. J. Douglass, of New Orleans; and Dr. E. P. Flower, Baton Rouge. Dr. Dikmans is conducting experiments and investigations on this disease at the B. A. I. Experiment Station, at Jeanerette, Louisiana. While not much is known about the manner in which the disease is transmitted, we are hopeful that Dr. Dikmans will solve this mystery. Although hampered by a lack of funds and equipment, Dr. Dikmans has already done some splendid work. Dr. Douglass covered the symptoms and reported that this disease has existed in Louisiana for the past ten years and is gradually spreading to all dairy herds around New Orleans. Dr. Flower reported that anaplasmosis has been found in Kansas, Oklahoma, Colorado and Washington. He related his experience with an outbreak of the disease in the dairy herd belonging to the Louisiana State University.

The closing paper on the program of the first day was by Dr. E. P. Flower, state veterinarian, on the subject of "Interstate Health Certificates."

At the business session ten veterinarians were admitted to membership. Much business was transacted for the benefit of the profession, most important of which was the adoption of a tentative agreement between the Extension Department of the University and the practicing veterinarians, whereby the veterinary practitioner will no longer have to consider the county agent as a competitor. Our Committee on County Agent Activities and Infringements is to be congratulated on their splendid work along this line. The Committee was continued for another year.

The election of officers for the ensuing year resulted as follows: President, Dr. F. A. Hoell, Mansfield; vice-president, Dr. A. D. Kendrick, Homer; secretary-treasurer, Dr. H. A. Burton, Alexandria.

In the evening an excellent banquet was served in the dining-room of the Heidelberg Hotel. Among the guests were members of the Extension Department. Dr. C. J. Becker, ably filled the role of toastmaster.

The program for the second day was in charge of Dr. Harry Morris and consisted of demonstrations and lectures as follows:

A Microscopic Study of Blood. Dr. E. P. Flower, secretary of Live Stock Sanitary Board, Baton Rouge, La.

Anaplasmosis. (Preparation, staining and examination of blood smears.) Dr. G. Dikmans, Zoological Division, U. S. Bureau of Animal Industry, Jeanerette, La.

Short Method of Making the Agglutination Test for Infectious Abortion. Dr. Harry Morris and teaching staff.

Fecal Examination for the Presence of Parasitic Ova. Dr. Herbert Spender, Assistant Entomologist, Experiment Station, and teaching staff.

Parasites of Dogs. Dr. R. S. Mayhow, Parasitologist, Department of Biology, L. S. U.

Poisonous Plants. B. W. Edgerton, Professor of Botany, L. S. U.

Soy Beans as a Source of Protein in the Food Ration. Professor W. R. Dodson, Dean of the College of Agriculture.

Mammals of the Glacial Period in Louisiana. Dr. H. E. Howe, Professor of Geology, L. S. U.

Effects of Inbreeding, Linebreeding and Crossbreeding in Mice. Its Application to the Breeding of All Live Stock. Dr. Wm. H. Gates, Professor of Biology, L. S. U.

Mule Power *vs.* Tractor Power. C. L. Osterberger, Farm Mechanics, Louisiana Experiment Station.

Poultry Diseases. Clyde Ingram and G. W. Knox, Poultry Department, L. S. U.

Following this program, a trip was made to the Live Stock and Poultry departments of the University. Here, Professor C. H. Staples, of the Dairy Department, discussed pasture rotation and sanitation. Mr. V. C. Owen, of the Dairy Department, spoke on calf feeding and Professor E. L. Jordan, of the Animal Industry Department, spoke on winter rations for cattle. Mr. G. W. Knox, Jr., of the Poultry Department, addressed the members on incubators, brooder-houses, feeding, etc.

The members of the faculty at Louisiana State University certainly proved themselves to be excellent hosts and the only regrets were that the meeting came to a close too soon.

H. A. BURTON, *Sec.-Treas.*

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held at the Academy of Medi-

cine, 103rd St. & 5th Ave., New York City, Wednesday evening, March 7, 1928.

Dr. C. G. Rohrer presided. The attendance was thirty-two. The minutes of the February meeting were read and approved.

Dr. Chas. H. Higgins, of New York City, addressed the meeting on "The Trend of the Veterinary Profession." He showed the changes made necessary in the preparation of the veterinarian for the wide field now covered by the various branches of the profession. Dr. Higgins also gave the history of some of the most important animal diseases.

Mr. Schriever, of Parke, Davis and Company, showed a moving-picture film entitled, "How Biological Products are Made." This contribution to the program was a very interesting one because it gave the veterinarians an opportunity to see how biological products are prepared, with appropriate explanations by Mr. Schriever. Drs. C. S. Chase and R. W. Gannett discussed these two contributions.

Dr. Benjamin Finkelstein, of Brooklyn, N. Y., was admitted to membership

Dr. L. E. Crawford read a letter from Dr. A. L. Danforth, suggesting that the dates of the summer meeting of the New York State Veterinary Medical Society be set for July 11-12. Dr. Crawford moved that this Association recommend that the meeting be held at the Half-Moon Hotel, Coney Island. Seconded by Dr. McKeller and carried. A motion also prevailed that the assistance of the Practitioners' Club of Brooklyn, and of the Long Island Veterinary Medical Association be asked in preparations for the meeting.

In the place of the regular meeting for April, it was decided to hold a smoker and President Rohrer appointed the following committee on arrangements: Drs. R. W. Gannett, R. J. Garbutt and C. P. Zepp.

A rising vote of thanks was extended Dr. Higgins and Mr. Schriever for their interesting contributions to the program.

There being no further business, the meeting adjourned.

C. P. Zepp, *Secretary.*

MAHONING VALLEY VETERINARY CLUB

The regular meeting of the Mahoning Valley (Penna.) Veterinary Club was held in Johnstown, Pa., April 13, 1928. In the

morning a very interesting lecture was given by Dr. E. L. Stubbs, assistant professor of veterinary pathology, University of Pennsylvania Veterinary School, on the subject of "Pathology of the Digestive Tract in Cattle."

The afternoon session was in charge of Dr. Wm. J. Lentz, director of Small Animal Clinic, University of Pennsylvania Veterinary School, who conducted a clinic for small animals at the hospital of Dr. H. B. Prothero.

R. M. QUIGLEY, *Secretary.*

Minneapolis, the Breadbasket of the World

KANSAS CITY ASSOCIATION OF VETERINARIANS

The regular monthly meeting of the Kansas City Association of Veterinarians was held Wednesday evening, April 18, 1928. The entire program was devoted to the subject of rabies. The City and County health officials met with the Association and gave interesting talks on the rabies situation in their respective territories. About thirty-five veterinarians attended.

J. D. RAY, *Secretary.*

Minneapolis, the City of Lakes

NORTHEASTERN PENNSYLVANIA VETERINARY MEDICAL CLUB

A meeting of the Northeastern Pennsylvania Veterinary Medical Club was held at Hotel Casey, Scranton, Penna., April 19, 1928. Dr. W. J. Lentz, director of the Small Animal Clinic, University of Pennsylvania Veterinary School, addressed the meeting on "Some Phases of Small Animal Practice." The address was very interesting and enjoyed by all those present. The next meeting will be held in Montrose, the latter part of June. The lectures and demonstrations which are given at our meetings really constitute a sort of post-graduate course for the general practitioner. Dr. G. A. Dick, director of Veterinary Extension Work, University of Pennsylvania, supervises these courses.

T. D. JAMES, *Secretary.*

Minneapolis, the Youngest City of Its Size in the World

NEW ENGLAND CONFERENCE OF LABORATORY WORKERS IN BACILLARY WHITE DIARRHEA CONTROL

The first annual meeting of the New England Conference of Laboratory Workers in Bacillary White Diarrhea Control was held in Paige Laboratory, Massachusetts Agricultural College, Amherst, April 24-25-26, 1928.

This conference was probably the first of its kind to be held in the United States, and was of the nature recommended for studying problems on standardization of testing methods, cooperative tests, etc., in the report of the Poultry Disease Committee of the U. S. Live Stock Sanitary Association at its 31st annual meeting, held at Chicago, November 30, December 1 and 2, 1927.

The states cooperating and their representatives were: Connecticut, Dr. L. F. Rettger; Maine, Dr. F. L. Russell and Professor E. R. Hitchner; Massashusetts, Dr. W. R. Hinshaw, Dr. E. F. Sanders and Dr. N. J. Pyle; New Hampshire, Dr. E. M. Gildow; and Vermont, Professor A. W. Lohman.

Probably the outstanding accomplishment of this conference was an agreement to standardize as far as possible the agglutination tests used by the states represented. The test fluid to be used in the future by these states will be standardized as to turbidity, pH value, strains of organism, age of culture, examination of culture for purity, preservative, storage, maximum age, and testing of fluid for antigenic properties.

In regard to the strains of organisms to be used for making the antigen, each laboratory will furnish one strain to each of the other laboratories, all of the strains to be pooled, so that each laboratory will be using identical test fluids. It was decided that among these five strains some should be of the organism isolated from hens and some from chicks. It was also agreed that each laboratory should test its strains and choose the best agglutinating, typical, aerogenic strain to send to the other states.

Plans were made by the laboratories to make the following cooperative experiments during the coming year, to be reported at the next annual meeting: the use of sodium hydroxid in test fluids to prevent cloudy reactions; the age at which pullets can be tested; and the use of the "rapid" method of testing for checking atypical reactions and hemolyzed blood samples.

It was decided to hold annual meetings, the date and place of the next one to be announced later.

The laboratories represented reported the following totals for the past season:

	Total Flocks Tested	Flocks 100% Tested	Total Free Flocks*	Total Tests Made
Connecticut	144	101	78	102,319
Maine	179	135	73	79,000
Massachusetts	320	162	139	232,091
New Hampshire	159	91	94	79,539
Vermont	59	59	14	17,600
Totals	861	548	398	510,549

*No infection for one or more years.

Wednesday, April 25, the laboratory workers held a joint meeting with the New England live stock sanitary officials for the purpose of discussing accreditation of poultry. At this meeting the principal speakers were Professor F. J. Sievers, director of the Massachusetts Agricultural Experiment Station, Mr. O. S. Flint, manager of the Massachusetts Association of Certified Poultry Breeders, and Professor J. E. Rice, head of the Poultry Department of Cornell University.

W. R. H.

MASSACHUSETTS VETERINARY ASSOCIATION

The annual meeting of the Massachusetts Veterinary Association was held at the University Club, Boston, April 25, 1928. A banquet was served at 6 o'clock, about 45 members being present. Entertainment and music were provided. Community singing and several violin solos by Dr. Harry W. Jakeman were also part of the program.

A short business session was conducted and various reports of committees submitted. Dr. Ralph Youmans gave a very interesting report from the Veterinary Welfare Committee, outlining the working plans adopted. This Committee has undertaken to bring about an improvement in conditions for the veterinarians of Massachusetts. Publicity through the newspapers, agricultural journals, etc., legislation in connection with the tuberculin test and vaccination of hogs, the publication of a

booklet on the veterinary profession, and the standardization of certain methods and fees, are parts of the program undertaken by this Committee.

It was voted to raise the annual dues from $3.00 to $5.00.

Officers for the ensuing year were elected as follows: President, Dr. F. H. Bradley, Plymouth; 1st vice-president, Dr. E. A. de Varennes, Quincy; 2nd vice-president, Dr. J. K. Mason, Campello; secretary and treasurer, Dr. H. W. Jakeman, Boston.

After a few well chosen remarks by the retiring president, Dr. Chas. Winslow, a short reminiscent and characteristically humorous address was given by Dr. Langdon Frothingham.

The speaker of the evening, Dr. W. S. Plaskett, of Clinton, was then introduced by Dr. Harrie Peirce. Dr. Plaskett gave a travelogue of his recent automobile trip to the Pacific Coast and back. To say that this was a treat for all is putting it mildly. Dr. Plaskett's command of English, coupled with his rare humor and descriptive ability, held close attention for over an hour.

H. W. JAKEMAN, *Secretary.*

Minneapolis, by the Waters of Minnetonka

CENTRAL MISSOURI VETERINARY MEDICAL ASSOCIATION

The Central Missouri Veterinary Medical Association held its regular spring meeting at the Hotel Bothwell, Sedalia, May 5, 1928. Twelve veterinarians attended. Various subjects of interest were discussed. Swine problems occupied the most important place on the program. Much concern was shown with reference to the prevention and control of so-called dysentery or bloody diarrhea of swine. This condition seems to be widespread, and extensive losses are reported from some localities.

The following officers were elected for the coming year: Dr. W. B. Welsh, Marshall, president; Dr. J. B. Rand, Bunceton, vice-president; and Dr. J. S. McDaniel, Sedalia, secretary-treasurer.

The fall meeting will be held at Marshall.

J. D. RAY, *Res. Sec. for Missouri.*

Minneapolis, the Land of Hiawatha

NECROLOGY

CHARLES FRANCIS DAWSON

Dr. Charles F. Dawson died in the Johns Hopkins University Hospital, Baltimore, Md., February 26, 1928. He had been in declining health for the past several months. The immediate cause of death was pneumonia.

Born at Trappe, Md., May 3, 1863, Dr. Dawson received his early training in the McDonald School, a school for orphans located in Maryland. After completing his studies there he entered Johns Hopkins University taking courses in science. While a student at Johns Hopkins he was employed as a laboratory assistant. Later he entered Baltimore Medical College and received the degree of Doctor of Medicine from that institution in 1885.

In September, 1893, Dr. Dawson entered the service of the Bureau of Animal Industry as an expert laboratory assistant. While he was employed in the laboratory ,at Washington, he pursued a course in veterinary medicine in the National Veterinary College, then a part of Columbian University. He received his degree in 1895 and was appointed as a veterinary inspector July 1, 1896. He resigned from the Bureau service February 28, 1900. Dr. Dawson returned to the Bureau, March 24, 1908, as an expert on anthrax and was assigned as Station Veterinarian at Newark, Delaware, in cooperation with the State College of Agriculture. His services with the Bureau were terminated June 30, 1914.

Between his two periods of Bureau service, Dr. Dawson was employed as veterinarian for the Florida Agricultural Experiment Station then located at Lake City. He served in that capacity until 1905 and during the time that he was veterinarian for the Florida Station he wrote a large number of bulletins. In 1906 Dr. Dawson accepted the appointment of State Veterinarian of Florida. This office was under the authority of the State Board of Health at that time. He continued as State Veterinarian of Florida until 1917, when the present State Live Stock Sanitary Board was created. Upon leaving the office of State Veterinarian Dr. Dawson engaged in practice and also sold biological products in Jacksonville.

WILLIAM T. PUGH

Dr. William T. Pugh, of Southbridge, Massachusetts, died at his home, April 8, 1928, following a protracted illness. He was 65 years of age.

Born in Claremont, Ontario, he attended the Ontario Veterinary College and was graduated in 1895. He located in Southbridge a short time later and remained there until his death. For twenty years, he had been meat inspector of the town.

Dr. Pugh joined the A. V. M. A. in 1911. He was a member of the Massachusetts Veterinary Medical Association, Quinebaugh Lodge, A. F. and A. M., and the Southbridge Merchants' and Manufacturers' Association.

He is survived by his widow, one sister and one brother.

OLIVER M. BURNS

Dr. Oliver M. Burns, of Liberty, Indiana, died at his home, April 13, 1928, aged 57. Dr. Burns had been suffering from heart trouble for several months. He was a registered non-graduate practitioner and at the time of his death was serving as City Health Officer.

WINFIELD S. FOWLER

Dr. Winfield S. Fowler, of Waynetown, Indiana, died at his home May 6, 1928. He had been in failing health for several years, but death was hastened by the effects of a broken hip sustained three weeks previously.

Born near Waynetown, May 4, 1866, Dr. Fowler secured his veterinary education at the Indiana Veterinary College. He was a member of the class of 1908. He practiced at Waynetown up until his final illness. Dr. Fowler is survived by his widow, three sons and six daughters.

ALFRED A. MOODY

Dr. Alfred A. Moody, of Sault Sainte Marie, Ontario, committed suicide by hanging himself in the police detention room of the City Hall, Sault Sainte Marie, Michigan, May 6, 1928. He had been arrested, according to a press report, on a charge of being implicated in a narcotic smuggling ring, which was recently uncovered by the authorities. Dr. Moody was a graduate of the Ontario Veterinary College, class of 1895.

PERSONALS

Minneapolis, America's Vacation City

MARRIAGES

Dr. F. F. Sowards (Chi. '20) to Mrs. Tessie Likens, both of Orangeville, Ill., February 7, 1928, at Belvidere, Ill.

Dr. W. E. Welsh (Iowa '27), of Hibbing, Minn., to Miss Golda Mae McKinnon, of Duluth, Minn., May 3, 1928.

Minneapolis, the City of Lakes

BIRTH

To Dr. and Mrs. Walter Emmert Neary, of Moscow, Idaho, a son, Walter Emmert, Jr., April 28, 1928.

Minneapolis, the 1928 Convention City

PERSONALS

Dr. S. P. Regan (Corn. '15) is practicing at Wellsville, N. Y.

Dr. A. H. Russell (Corn. '20) is practicing at Concord, Mass.

Dr. Murray Howes (Corn. '10) is engaged in practice in Portland, Ore.

Dr. D. L. Pease (Corn. '20) is Schoharie County (N. Y.) Veterinarian.

Dr. A. E. Rowson (Ont. '18) has left Duluth, Minn., and located at Faribault, Minn.

Dr. K. W. Keyes (Corn. '27) is assisting Dr. F. F. Russell (Ont. '13), of Concord, N. H.

Dr. O. F. Cox (Colo. '21), formerly at Portsmouth, Iowa, has located at Audubon, Iowa.

Dr. Andrew Hyde (Amer. '87) is a member of the Council of the borough of Brooklawn, N. J.

Dr. C. B. Shore (U. P. '17) is manager of the North American Silver Fox and Fur Ranch, at Holicong, Pa.

Dr. W. Walter Martin (U. P. '95) has returned to Spring Lake, N. J., after spending the winter in Miami, Fla.

Dr. C. C. Hunt (Ind. '10) who has been located at Ward, S. Dak., the past year, is now at Flandreau, S. Dak.

Dr. M. M. Davis (McK. '15-Ont. '22) has changed locations from Rapid City, S. Dak., to Bloomington, Wis.

Dr. T. B. Harries (McK. '06) has removed from Strathmore, Alberta, to 816 Fifth Avenue, W., Calgary, Alta.

Dr. D. N. Voetberg (Iowa '27), formerly of Grundy Center, Iowa, has located at Albia, Iowa, for general practice.

Dr. J. L. Kixmiller (Ind. '15), formerly of Logansport, Ind., is now located in Indianapolis. Address: 4108 Carrollton Ave.

Dr. J. C. Conway (T. H. '14), of New Goshen, Ind., has removed to Winchester, Ind., for the practice of his profession.

Dr. E. H. Barger (K. S. A. C. '21) has requested a change of address from Davis, Calif., to 2424 Hilgard, Berkeley, Calif.

Dr. Frederick Stehle (U. P. '01), of Atlantic City, N. J., represents his ward on the Board of Freeholders and recently assumed the duties of manager of the Atlantic County Republican headquarters.

Dr. A. E. Alexander (Ind. '11), of Westport, Ind., has taken over the practice of the late Dr. O. M. Burns, at Liberty, Ind.

Dr. John H. Gooding (Wash. '21), of Dixon, Calif., has removed to Modesto, Calif., where he expects to be located permanently.

Dr. E. D. Stafford (Corn. '18) is in the milk-producing business at Blodgett Mills, N. Y., and does some practicing on the side.

Dr. D. R. Cook (San Fran. '18), formerly located at Delano, Calif., has removed to Bakersfield, Calif. Address: 1824 22nd St.

Dr. W. N. Armstrong (Ont. '94), of Concord, Mich., is president of the Southern Michigan Fair and Race Circuit Association.

Dr. Fred F. Saint (Ont. '18), who has been located at Winnipeg, Man., for some time, now receives his mail at Minnedosa, Man.

Dr. Charles B. Conyer (McK. '13) has disposed of his retail milk business at Richland, Mich., and resumed private practice at that place.

Dr. Frederick .R. Whipple (McK '02) opened his new Broadway Small Animal Hospital, at 6320 Broadway, Chicago, Ill., the past month.

Dr. W. G. Clark (Chi. '93), of Marinette, Wis., is District Manager, representing the Inter-State Business Men's Accident Association, of Des Moines, Iowa.

Dr. Murray Newbury (Chi. '93), of Hanover, Mich., has been appointed official veterinarian to the Jackson State Prison, at Jackson, by Governor Green.

Dr. L. B. Ford (Ont. '16), who has been located in Toledo, Ohio, for some time, has taken over the practice of the late Dr. B. C. Eldredge (Ont. '02), at Swanton, Ohio.

Dr. Geo. H. Berns (Columbia '79), of Brooklyn, N. Y., recently gave a talk on the transmissiblity of bovine tuberculosis to the human family, before the Men's Club of his church.

Dr. John P. Hutton (O. S. U. '11), of Michigan State College, officiated as secretary of the Michigan State College R. O. T. C. Horse Show, held at East Lansing, May 29-30.

Dr. William Caslick (Corn. '27) has resigned his position at the New York State Veterinary College to take over the practice of the late Dr. Edw. Rafter (Ont. '95), at Hamburg, N. Y.

Dr. Paul S. Dodd (Ind. '18), of Westfield, Ill., has given up his practice at that place to accept a position with the State Department of Agriculture. He is now located at Kansas, Ill.

Dr. N. D. Bailey (Mich. '24), of Mears, Mich., was badly cut about the scalp and face, when his automobile collided with a freight car on a crossing near Baldwin, the latter part of April.

Dr. Frank L. Harrison (Ont. '07), of Fairgrove, Mich., has purchased the practice of his father, Dr. Richard Harrison (Ont. '91), who has been located at Bad Axe, Mich., for thirty-seven years.

Dr. A. B. Crawford (Geo. Wash. '14), of the staff of the B. A. I. Experiment Station, at Bethesda, Md., has been confined to the hospital for two months with an attack of undulant fever.

Dr. J. E. Severin (O. S. U. '16) has resigned his position in the Division of Veterinary Medicine, Georgia State College of Agriculture, Athens, effective June 1. He will enter a partnership with Dr. A. B. Griner (Ga. '26) at Fitzgerald, Ga.

Dr. Warren P. S. Hall (Mich. '20) has resigned his position as Assistant Chief Veterinarian, with the Detroit Board of Health, to accept the position of Chief of the Foods and Drugs Division in the Department of Health, Toledo, Ohio.

Dr. J. A. Howarth (K. S. A. C. '23), who has had charge of the work in veterinary bacteriology and pathology at Washington State College for several years, has resigned to accept a position with the University of California, at Davis, Calif.

Dr. George R. Fowler (Wash. '25), who has been in charge of anatomy at the College of Veterinary Medicine, State College of Washington, for the past four years, has resigned. He will join the staff of the Department of Anatomy at Iowa State College.

Dr. R. L. Allen (K. C. V. C. '05), of Windsor, Mo., had a very bad attack of appendicitis and was operated on at the St. Joseph Hospital, in Kansas City, a few weeks ago. Dr. Allen has returned home and the latest report was to the effect that he was getting along nicely.

Dr. William H. Ivens (U. P. '10) was given a testimonial dinner at Belmont Mansion, Fairmount Park, on April 6, by the Saddle Horse Association of Philadelphia, in honor of the splendid work that he has done during the past year as chairman of the Executive Committee of that organization.

Dr. G. P. Statter (Ont. '96-McK. '99), of Sioux City, Iowa, recently cooperated with Mr. Harry D. Linn, Assistant Secretary of Agriculture, in putting on a demonstration of the multiple hitch of driving several teams of horses. The demonstration was conducted at the Sioux City Stock Yards.

Dr. L. T. Oberheim (Chi. '13), of Elizabeth, Ill., had a narrow escape from serious injury when his coupe crashed and burst into flames, while he was making a call recently. Something on his car gave way and the machine crashed into an embankment with such force that every window was shattered and the doors were jammed. Dr. Oberheim managed to get himself out of the car by kicking a hole through the roof.